

Chemical Week

November 30, 1957

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Special Report,
106 pages of . . .

CHEMSHOW COVERAGE



Chemshow at New York Coliseum.

Here's the only complete, up-to-the-minute preview of next week's 26th Exposition of Chemical Industries. Who'll be there, what they'll show, how to make the most of your visit p. 54

What's ahead for Gulf Coast chemical industry? CMRA-CCDA forecasts for 1965 p. 39

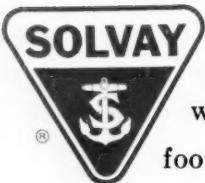
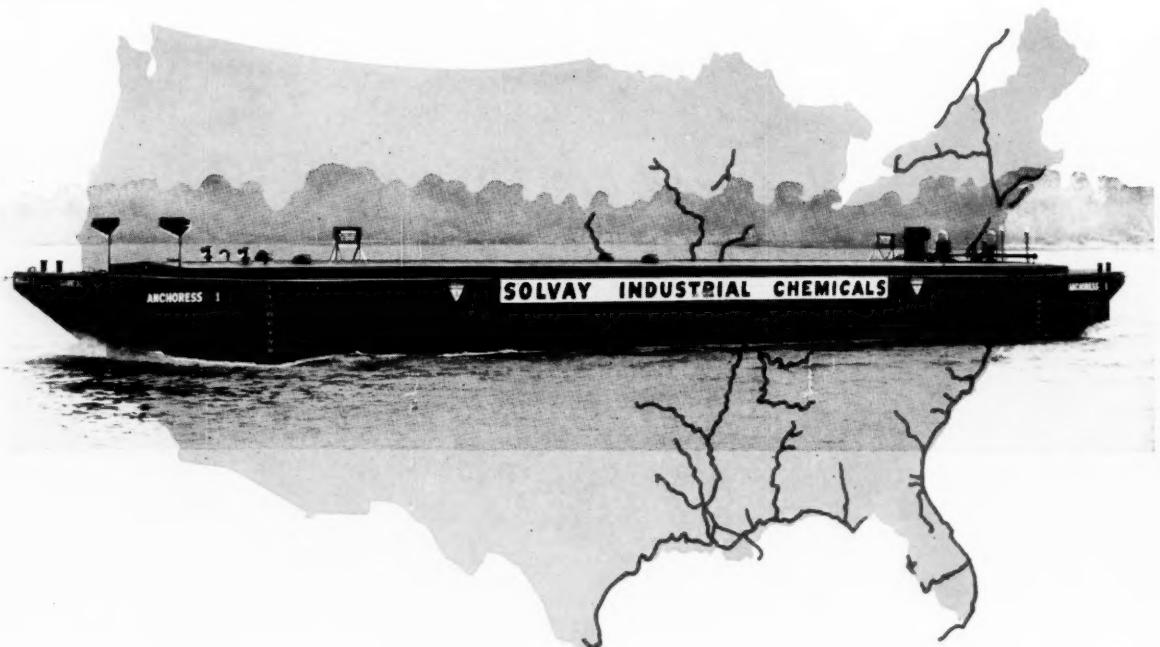
Purchasing agents' pet peeves, and how to avoid them . . . p. 49

Reichhold's record-setting year. Stock sale pays a dividend in boosted company earnings . . p. 75

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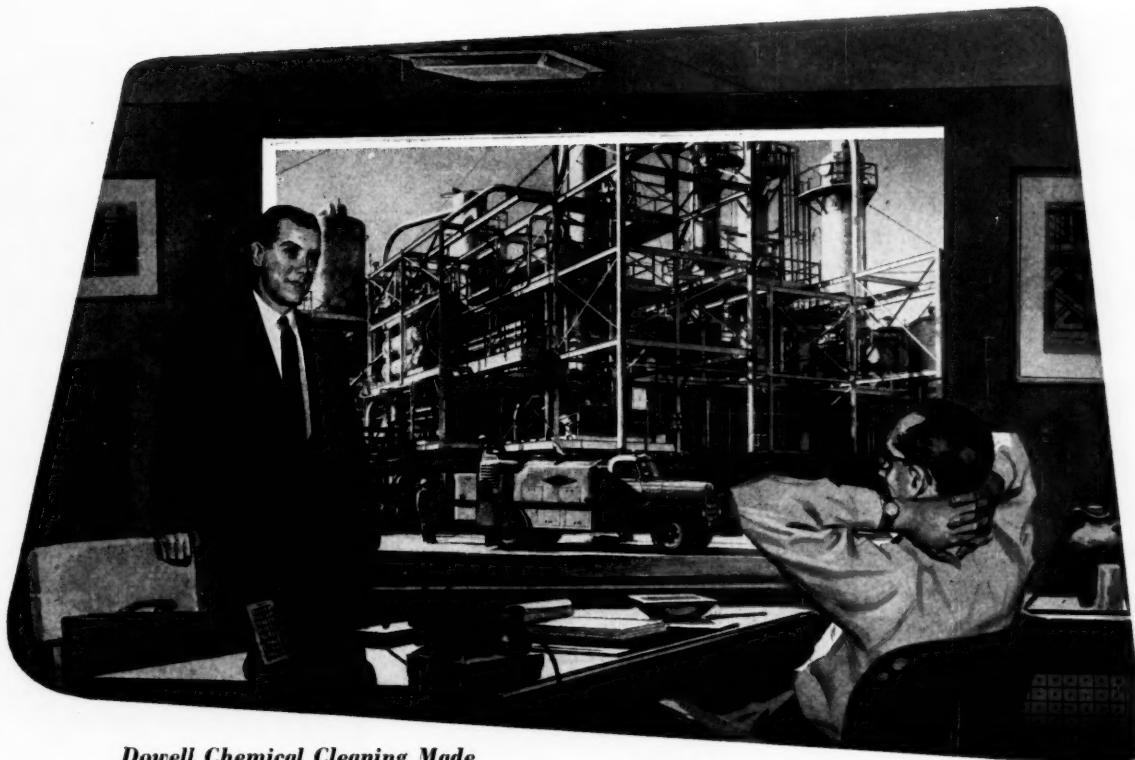
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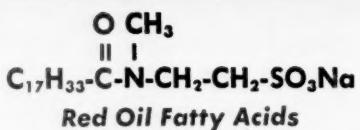
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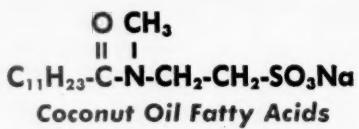
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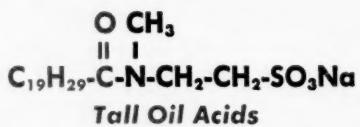
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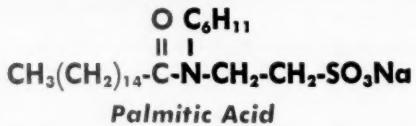
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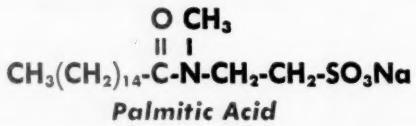
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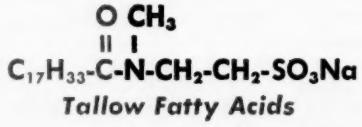
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TOP OF THE WEEK

November 30, 1957

Special 106-page Chemical Show insert—tear it out and take it with you to the biggest-yet exposition of the chemical industries p. 54

Fermentation bids for more roles in chemical processing, synthesis, as microbiologists gather in New York to celebrate Pasteur's discoveries p. 65

Expanded markets for residual bactericides on textiles may grow out of Sears, Roebuck's promotion of germproofed apparel p. 97

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97 SPECIALTIES

Textile germproofers get promotional break from Sears, Roebuck.

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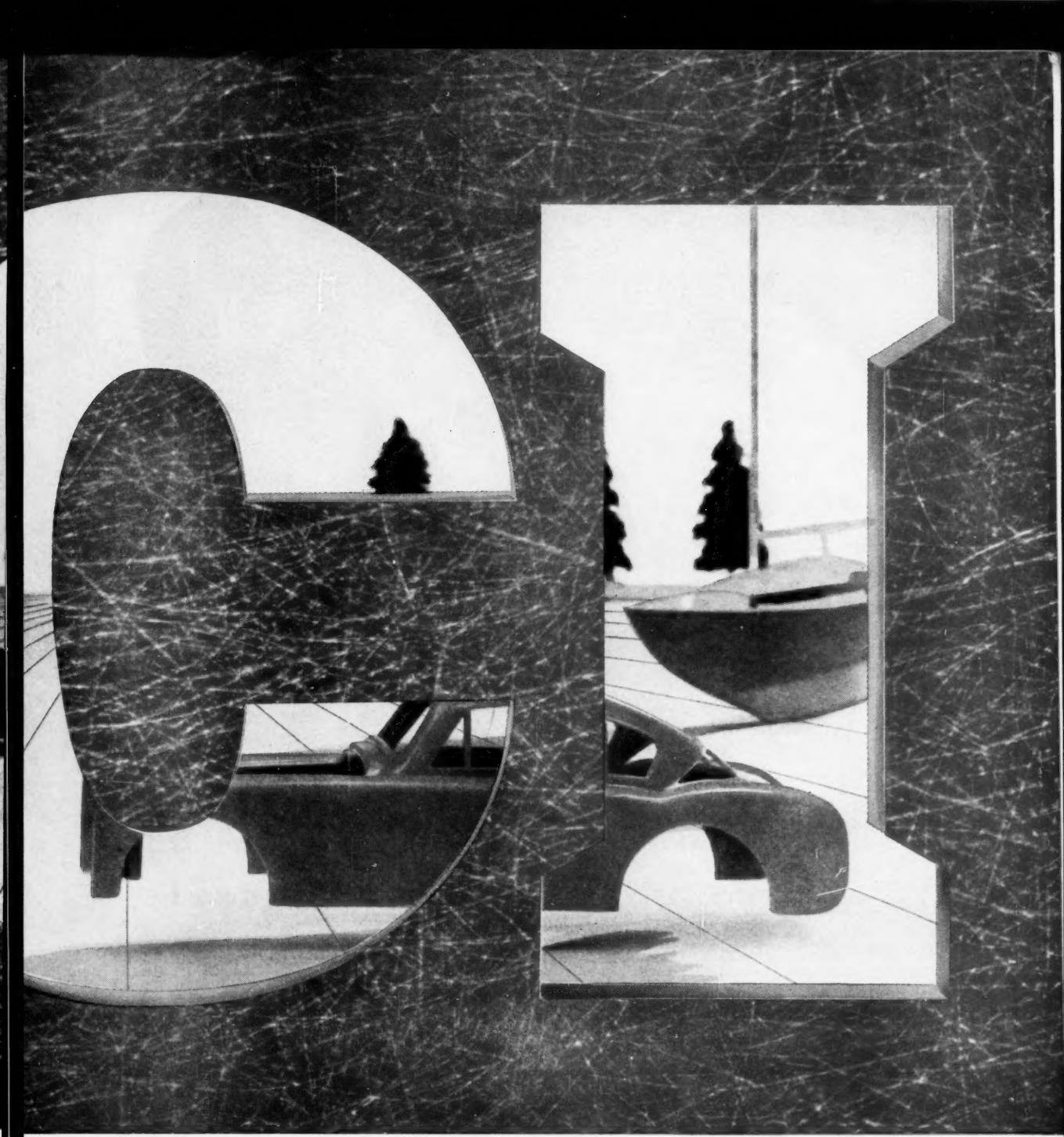
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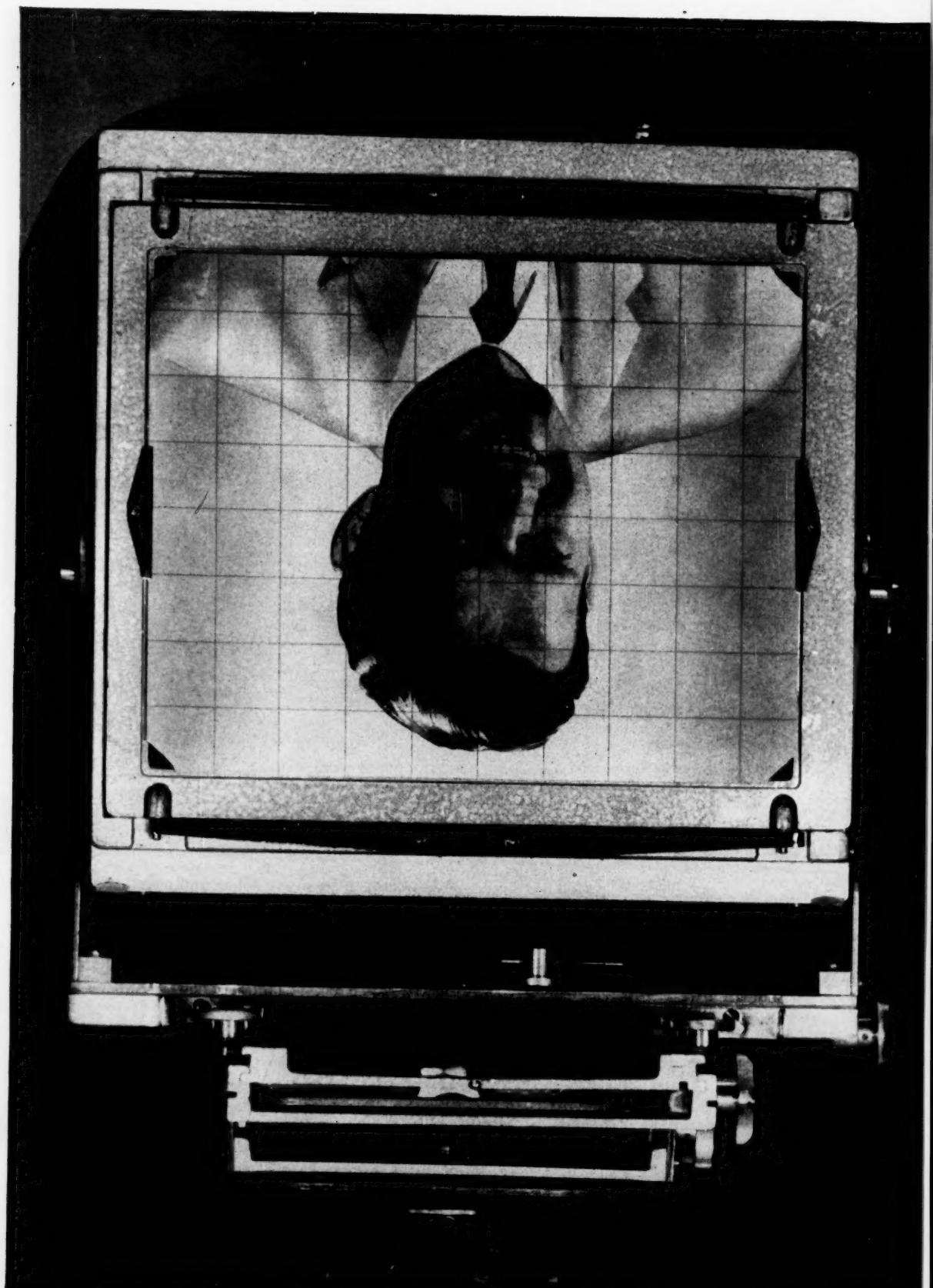
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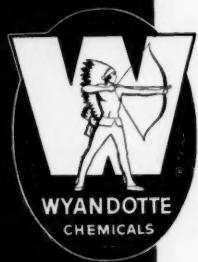
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If you are a Wyandotte distributor, you know what we mean when we say, "the chemical distributor is very much in our picture."

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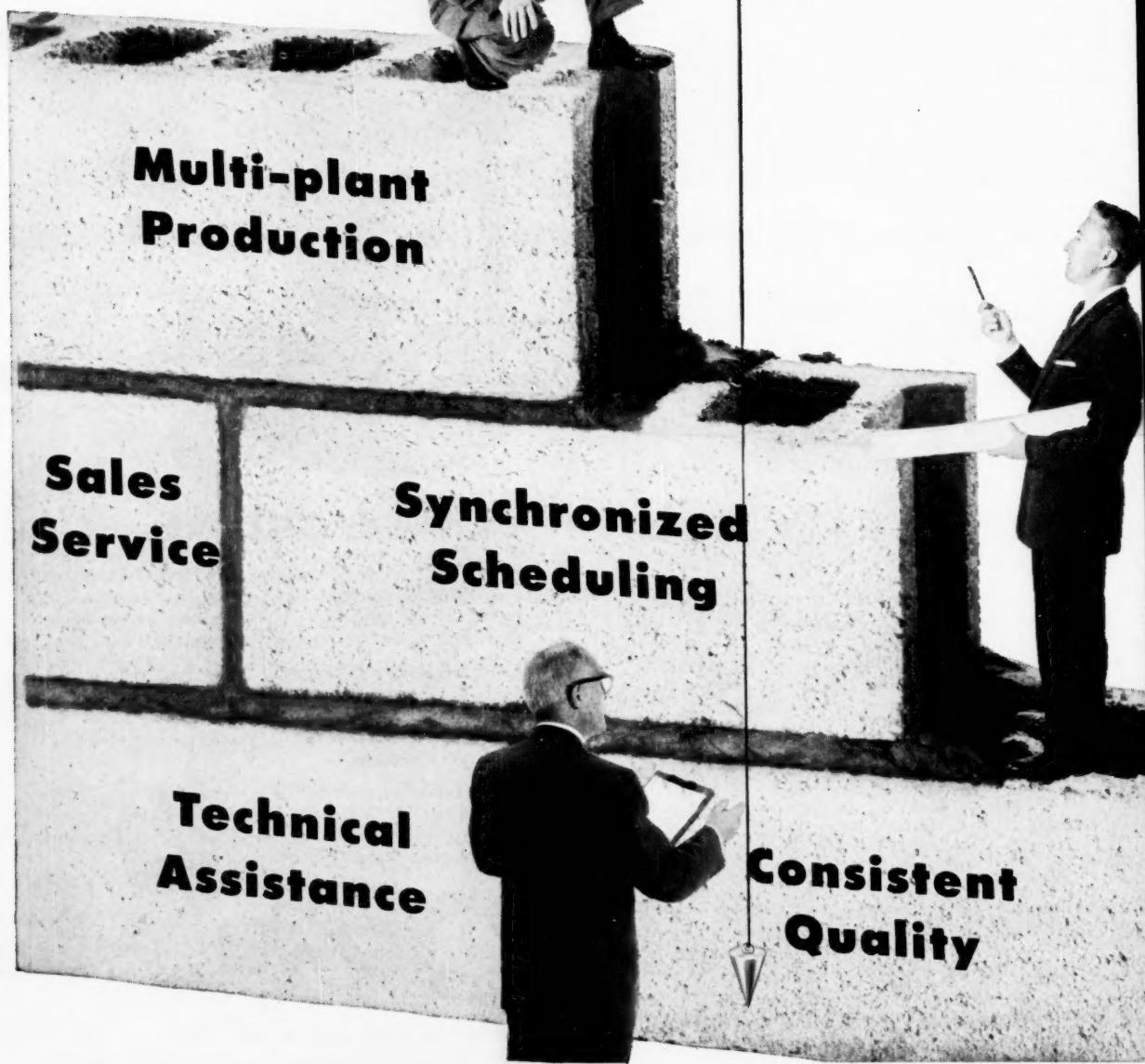
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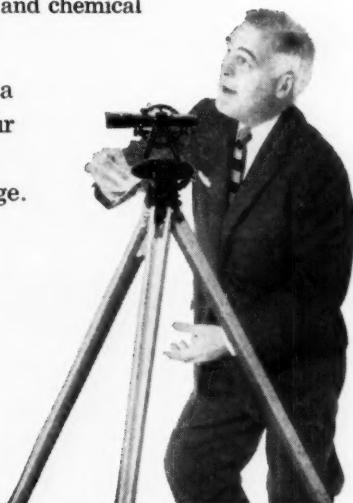
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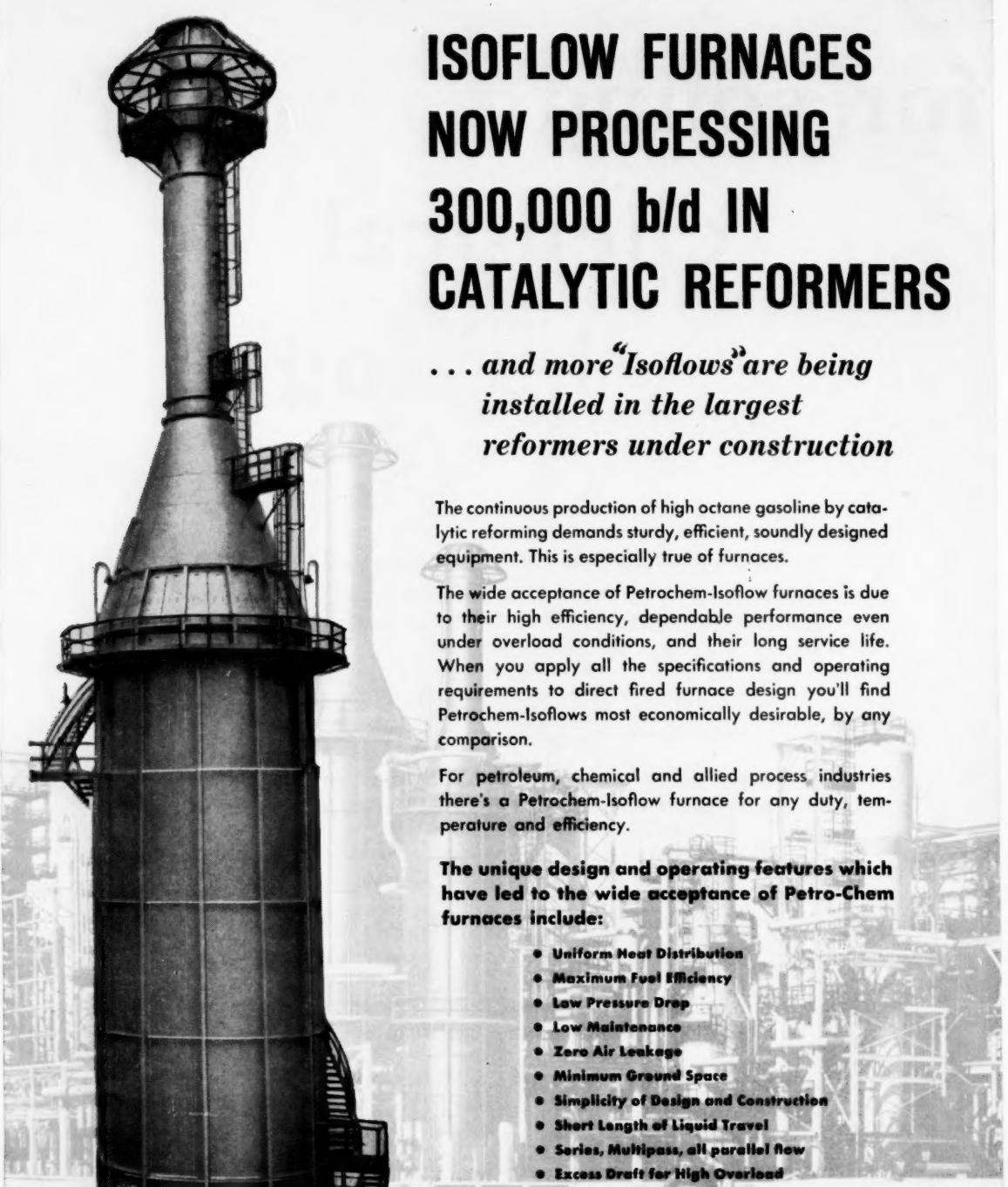
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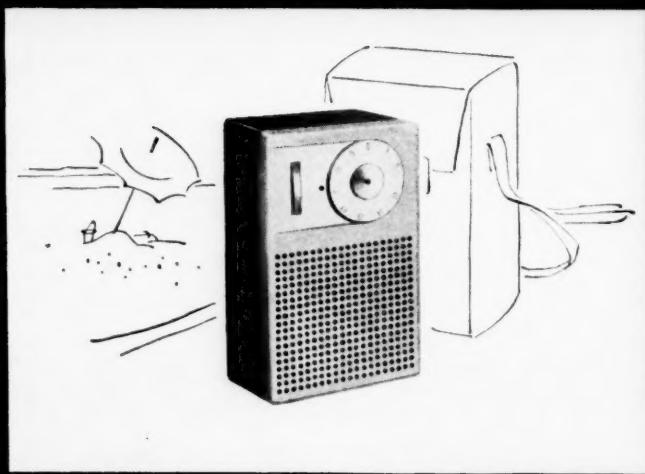
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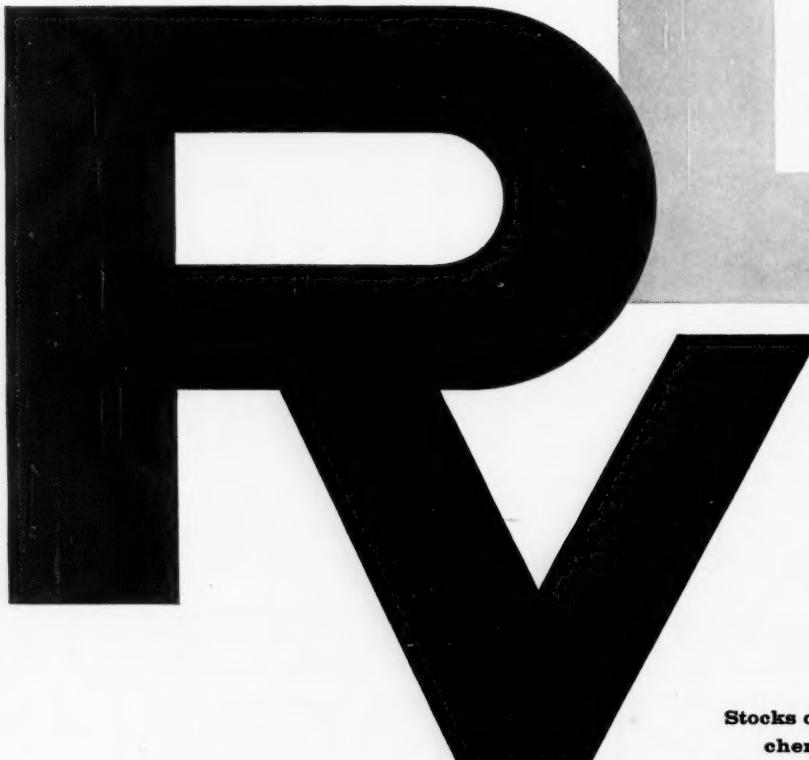
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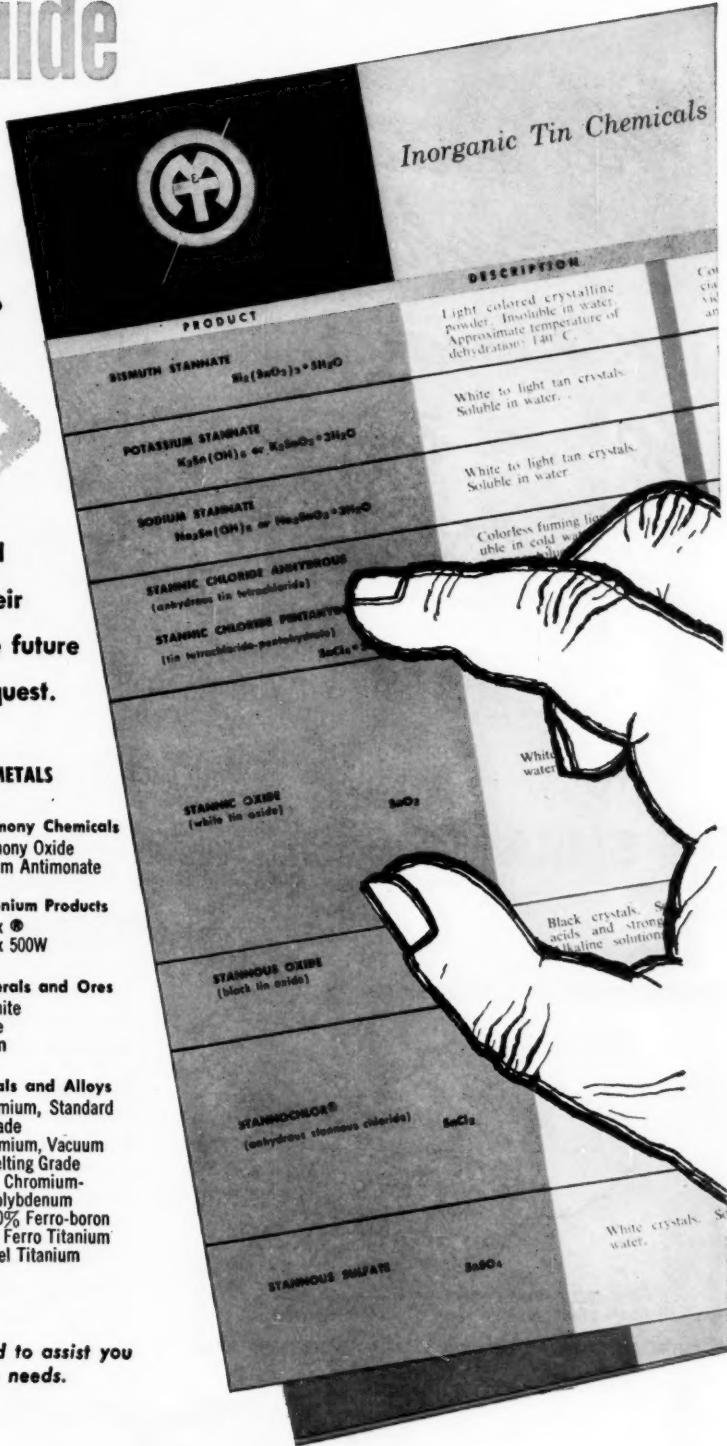
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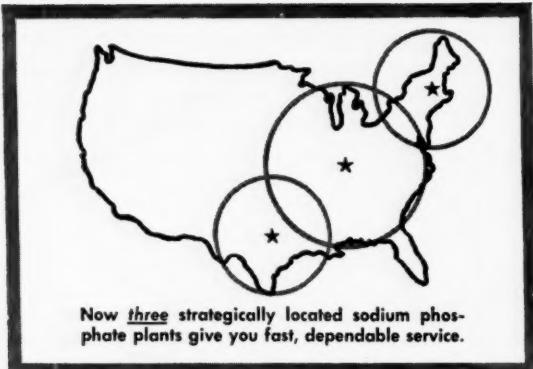


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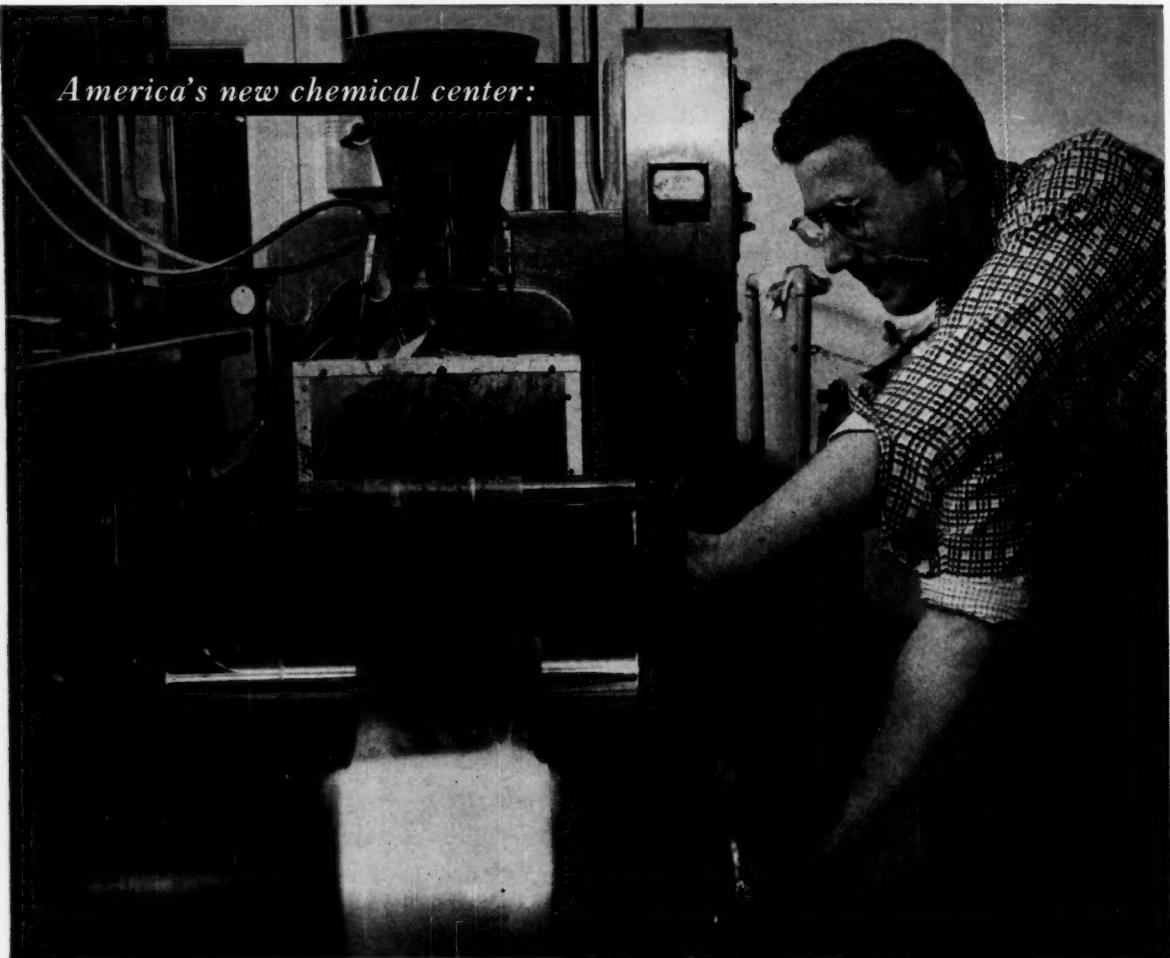


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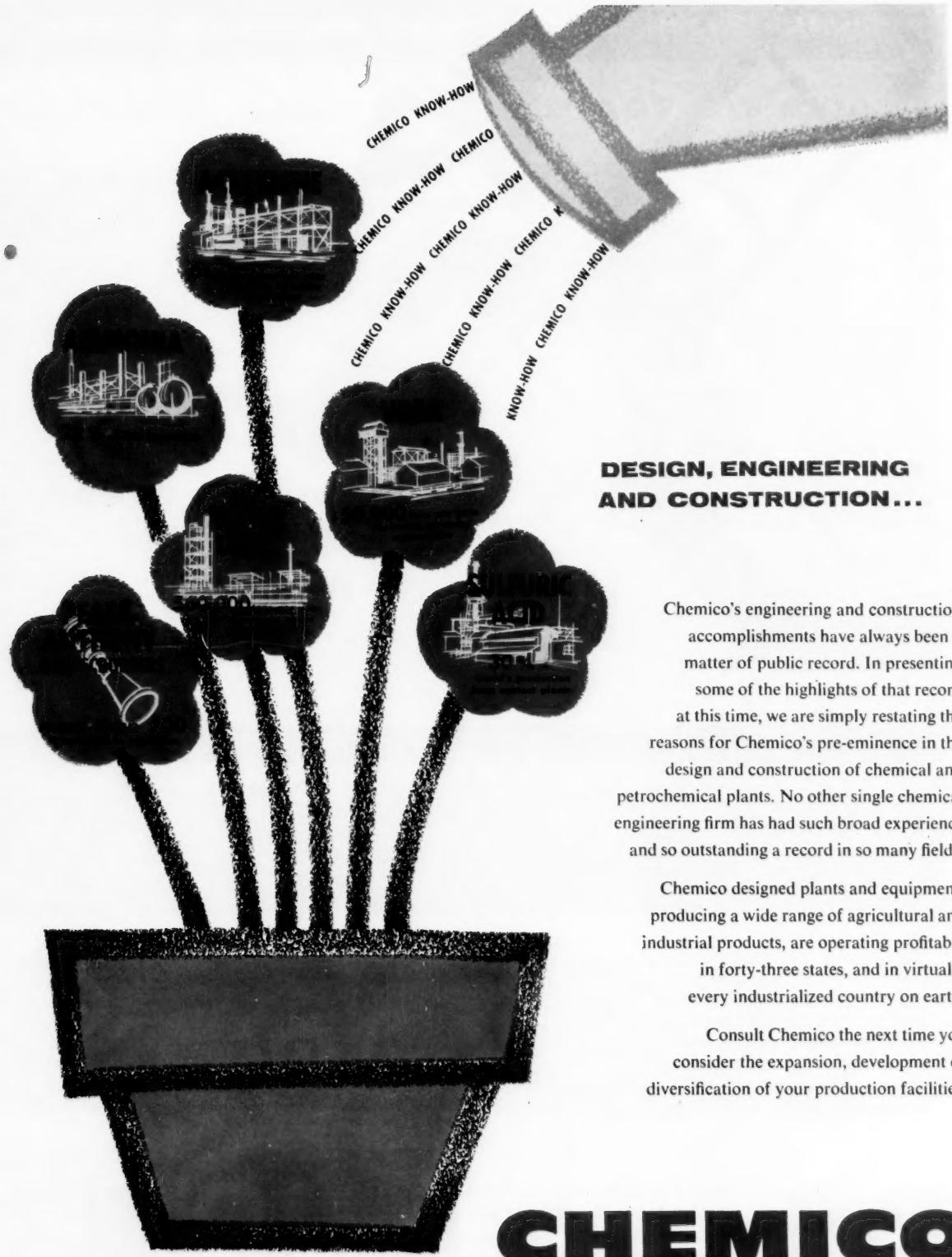
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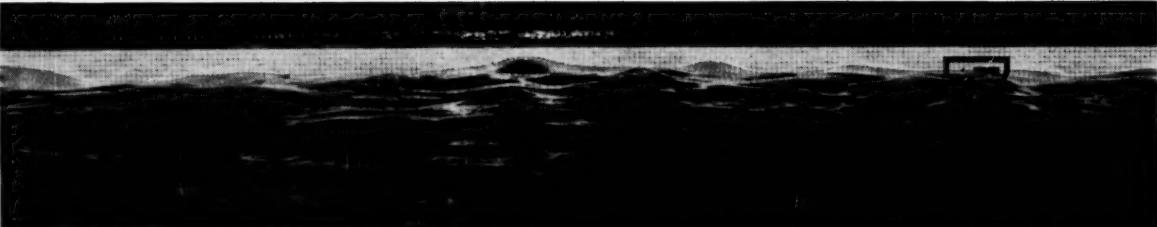
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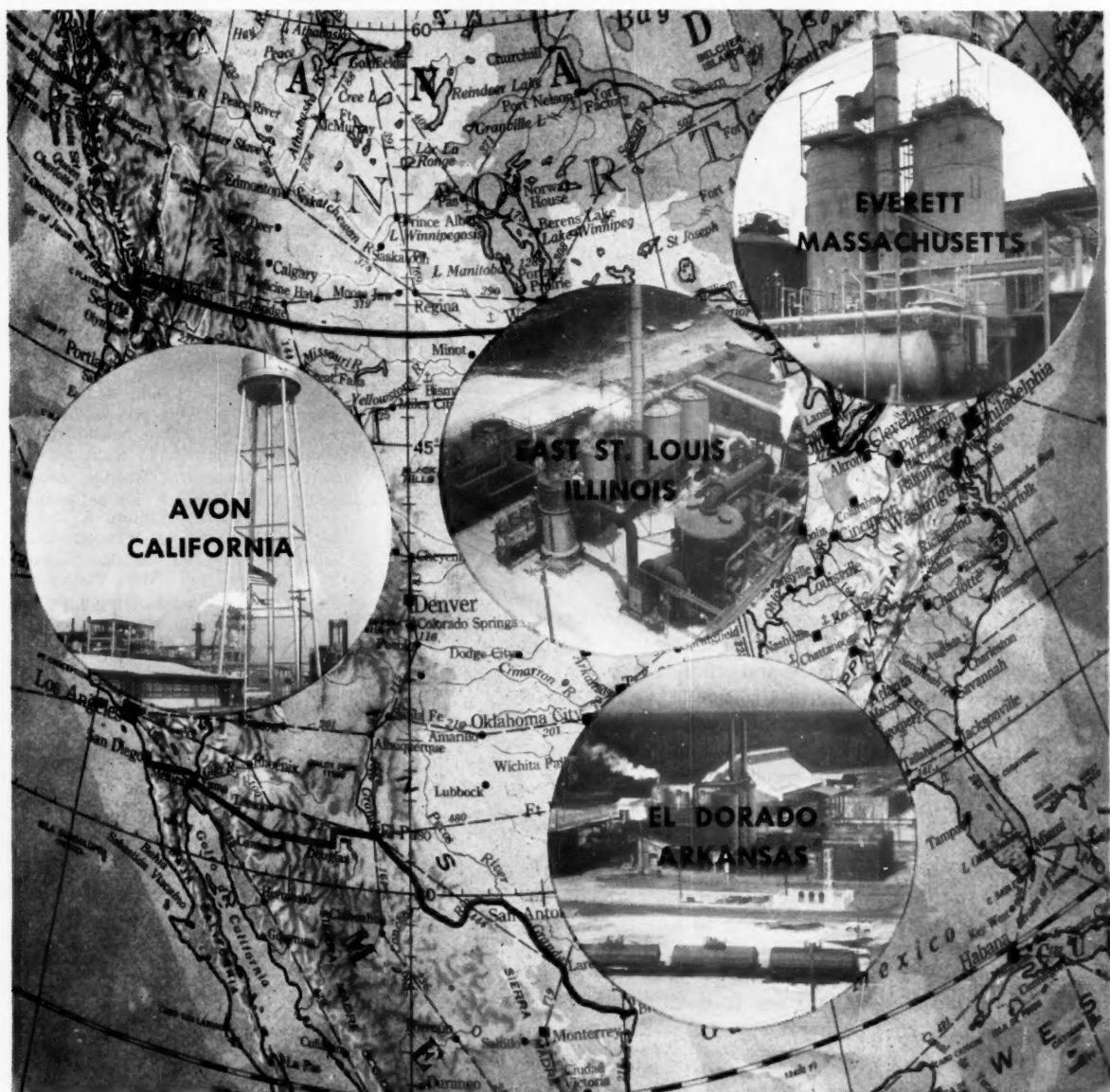
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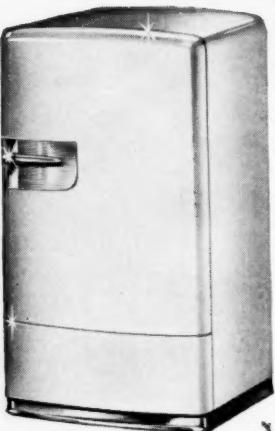
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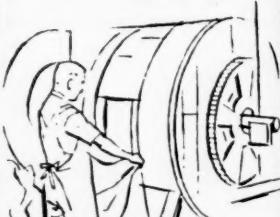
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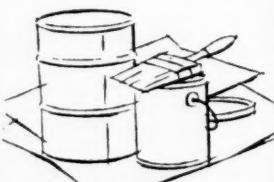
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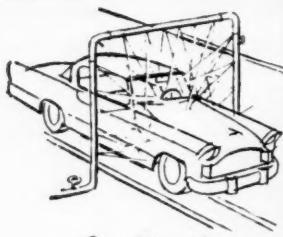
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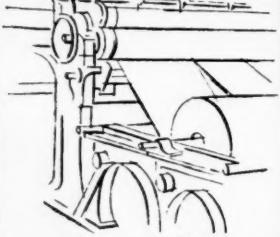
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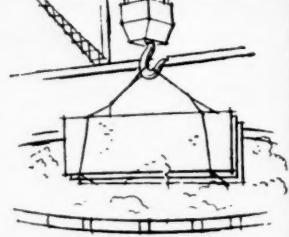
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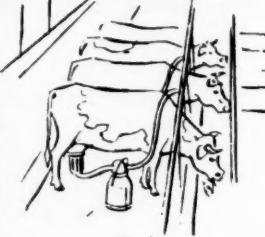
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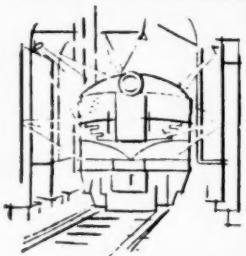
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Business Newsletter

CHEMICAL WEEK
November 30, 1957

Monday evening's first brief report of the President's illness triggered thoughtful exchanges among chemical management men arriving in New York for the Manufacturing Chemists' Assn.'s winter meeting. Conjecture about possible effects of another major layup dealt with subjects ranging from the missile program to anti-recession measures. But little could be said with assurance. Because of the cryptic tone of the White House bulletin, the MCA—and the nation at large—could only guess about the seriousness of the President's ailment—or whether he was really ill at all.

How to put across the chemical industry's viewpoint came in for plenty of attention on the formal scheduled agenda. One of six panels crammed into the one-day program, the discussion underscored the basic theme of the winter meeting: a critical examination of some of the chemical industry's problems and procedures.

As Vick Chemical's Thomas Wolfe pointed out, unions spend about 35% of their income on communications activities (public relations, plant newspapers, advertising, etc.)—companies, on the other hand, spend half of one percent of their payroll for these functions.

One result of this disparity, General Electric's John McCarty said, is that the same public that accepts industry's products, goods and services has yet to be convinced that industry deserves the understanding and support of employees and community neighbors. Consequently, the four basic dimensions of business (designing, manufacturing, accounting and selling) have been jeopardized.

One area of jeopardy is legislation—at both state and federal levels—according to MCA's counsel Claude Hobbs. Hobbs was particularly concerned over opposition from unions to industry-sponsored bills to insure the safety of chemicals in food, pointing out that some union-proposed legislation would virtually throttle the development of new chemical products for improving the nation's food supply.

More on a company level than on an industry level were the remarks of Pitney-Bowes, Inc.'s Frederick Bowes, Jr. Bowes puts his faith in concentrated community relations to keep a company on good terms with employees and with the community.

Other subjects of panel discussions were reactive metals, plant safety, the economic climate, chemical advertising, and management of new products.

First trial of damage suits involving Cutter Labs' Salk vaccine is getting under way in Oakland, Calif., at Alameda County superior court. A jury was sworn in last week on a test case, which will probably influence the outcome of 43 other suits pending against Cutter. The suit, involving two children who contracted paralytic polio after receiving Cutter vaccine,

Business Newsletter

(Continued)

asks \$365,000 damages. Arguing against Melvin M. Melli, noted criminal lawyer who is representing the two children, Cutter will contend that the vaccine was manufactured according to government safety standards.

•

Strong confidence in the pulp and paper industry was voiced last week by Crown Zellerbach President A. B. Layton. Layton told San Francisco financial experts he believes reports of overexpansion of productive capacity "have been greatly exaggerated . . . new capacity . . . actually is much less than that suggested by information released earlier." Though profit for the industry won't be spectacular in the next few years, he figures that, as capacity of new or soon-to-be-operating plants is absorbed, the profit picture will brighten.

CZ—whose nine-months earnings were off 23% (down to \$8.5 million) in spite of 2% higher sales—is going ahead with plans to spend some \$50-55 million to complete its already-started expansions.

•

Processors of edible fats and oils are mounting an industry-wide campaign to counter publicity linking their products with heart disease. A special, seven-man committee, formed last spring, is quietly canvassing the industry to line up support for a nationwide public relations drive to spread the facts and combat "misconceptions" on the controversial issue. The committee seeks \$300,000 by year's end to implement its program.

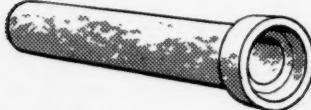
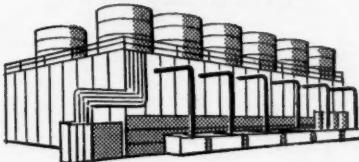
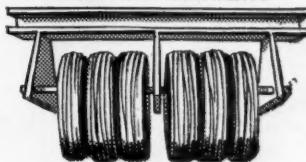
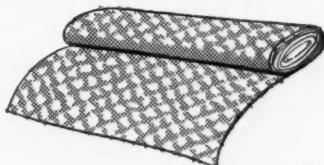
Processors face a major problem if housewives are being convinced—by one-sided presentation of arguments over medical risks of food fats—that they are feeding potentially hazardous products to their families. Housewives might stampede companies into changing product formulas, or face heavy sales losses.

Scientific arguments center around the disputed finding that certain fats (mainly the "soft" liquid fats) are less likely to cause heart disease than others (chiefly "hard" solid fats). Industry spokesmen insist they will make any changes in processing methods sought by a preponderance of informed medical opinion—but they feel such a preponderance of opinion is now lacking.

Procter & Gamble, Lever Brothers and Swift & Co. are among the most active promoters of the public relations campaign, and the committee membership includes officials of the American Dairy Council, The American Meat Institute, and the Institute of Shortening and Edible Oils.

•

It's bauxite that's luring Kaiser to Panama. Kaiser Aluminum & Chemical has obtained an exploration and mining concession from the government of Panama for a large section in the Western part of that country, near the Costa Rican border. "We're very optimistic about the prospects," says Kaiser Vice-President D. A. Rhodes. "Our preliminary studies indicate the deposits are extensive."

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Chloride as Cl (Max.)	0.06%	0.3%	0.005%
Sulfate as SO_4 (Max.)	0.2%	0.4%	0.007%
Vanadium as V (Max.)	0.005%	0.02%	0.002%

PROPERTIES

Crystal system	monoclinic, sphenoidal
Stability in air	deliquesces in humid air
Behavior on heating	changes to anhydrous (anhydrous salt melts @ 356.7°C, starts to decompose around 400°C)
Density	2.348 @ 25°C
Heat of solution	minus 28.2 cal/gram
Transition in solution	84.6°C to anhydrous
Eutectic with water	minus 48.2°C
Eutectic composition	69.0% $\text{Na}_2\text{Cr}_2\text{O}_7 \cdot 2\text{H}_2\text{O}$
Bulk weight	96 lb/cu ft

However you apply the properties of this chemical of many uses, Mutual Sodium Bichromate is available in forms, grades and packages to meet your requirements. It is produced in both technical and reagent grades, the former in both granular and solution form. Technical solution is shipped in tank cars and tank trucks. Technical granular is packaged in 100-lb. net paper bags, 400-lb. net fiber drums and both 100 and 400-lb. net steel drums; reagent granular, both 100-lb. net and 400-lb. net steel drums.

Buyers of Mutual brand, in addition to being guaranteed highest quality, are assured of expert technical assistance and within 24-hour shipping service when needed.

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Sodium Chromate
Chromic Acid

Potassium Bichromate
Potassium Chromate
Ammonium Bichromate

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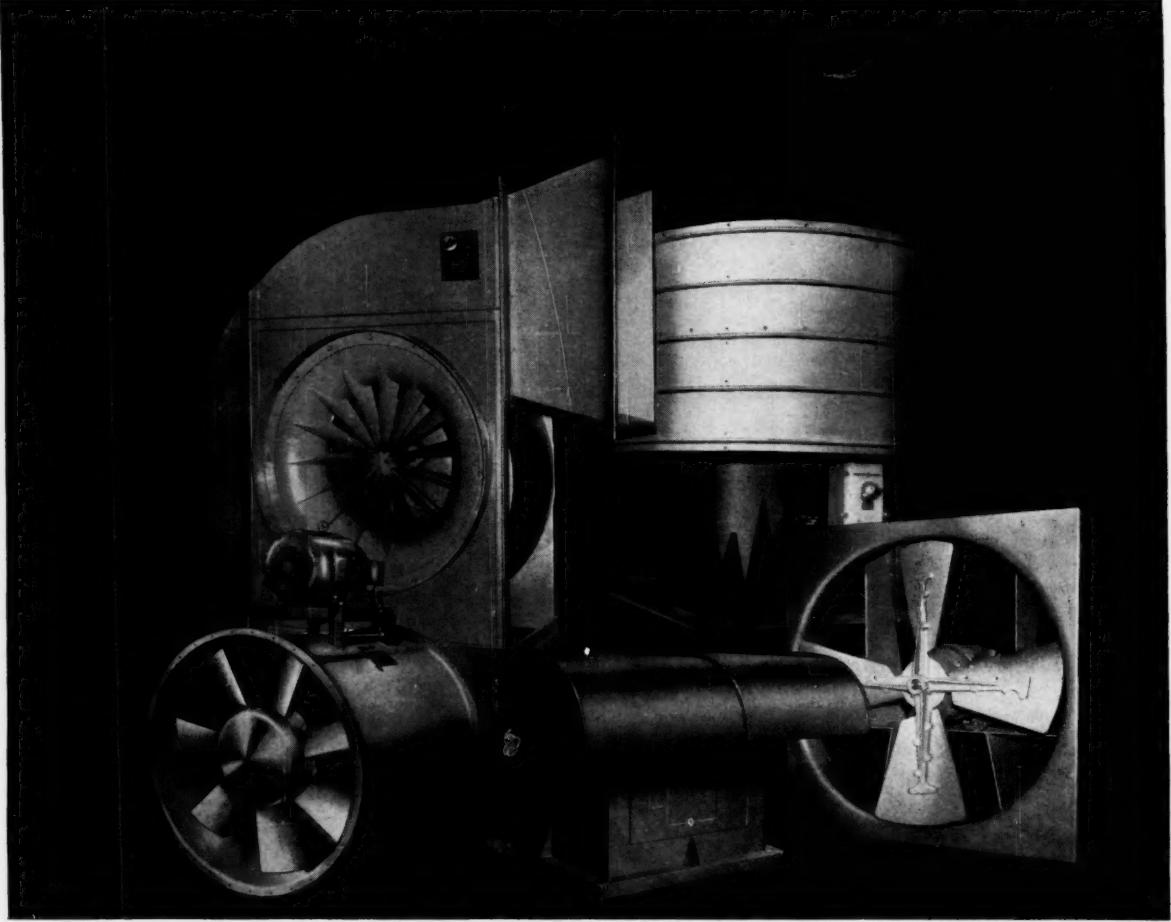
Please send your Bulletin 52, "Chromium Chemicals," by return mail.

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FAN'fare n. *a flourish of trumpets* ... Webster

It takes more than fanfare to sell fans for today's specialized industrial requirements — it requires the most complete line possible, with full selection of fan types, sizes, rotors and drive arrangements. Today, there's no such thing as a "general-purpose" fan.

"Buffalo" offers you this complete selection in propeller, axial flow and centrifugal fans. For instance, for large ventilation systems, you have a choice of type BL Fans for highest efficiency in Class I; and the new type BLH for peak performance on high pressure work. For mechanical draft and other heavy industrial work, you can select radial, airfoil,

backward curve or forward curve fans to match your requirements exactly. "Buffalo" Propeller Fans are built in 8" to 144" sizes to deliver up to 250,000 cfm — also available as package roof ventilators in many sizes. You can order rubber-lined exhausters, stainless steel fans, high-temperature fans, low-temperature fans, non-sparking and many others.

And beyond this, "Buffalo" engineering, testing and manufacturing facilities — working constantly *without* fanfare — are ready to work out the most specialized and difficult air problem you may have. Write for recommendations today!

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BUFFALO, NEW YORK

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.



VENTILATING AIR CLEANING AIR TEMPERING INDUCED DRAFT EXHAUSTING FORCED DRAFT COOLING HEATING PRESSURE BLOWING

November 30, 1957



In joint CMRA-CCDA meeting at Houston last week, industry experts foresee . . .

Galloping Future for Gulf Coast Chemicals

Sighting eight years into the future from various commodity viewpoints, industry experts speaking at Houston late last week foresaw as a strong possibility that the Texas-Louisiana Gulf Coast area may be the nation's No. 1 chemical production center by 1965.

To the more than 300 chemical-company delegates attending the joint

two-day meeting of Chemical Market Research Assn. and Commercial Chemical Development Assn. in the millionaire-frequented Shamrock Hilton Hotel, specialists from leading oil and chemical concerns presented a vigorously optimistic prediction that the Brownsville-to-New Orleans area is due to play a particularly eminent

role in producing chemicals from natural gas, refinery by-products, salt, sulfur, and sea water minerals (*table*, p. 40).

Stage-setter: Noting that a recent report by the Manufacturing Chemists' Assn. places Texas and Louisiana first and second, respectively, among the 48 states in number of chemical

Forecasts from Houston: No Slackening in Upsurge

<u>Commodity</u>	<u>Current Level</u>	<u>Predicted for 1965</u>	<u>Expected Increase</u>
INORGANIC CHEMICALS			
Total salt production—U.S. (tons)	25 billion	32-45 billion	60%
" " " — Gulf Coast	8 billion	16-24 billion	150%
Salt usage in chemical manufacturing — Gulf Coast	6 billion	12 billion	100%
Chlorine production — U.S. (tons)	4 million	7-10 million	100%
Chlorine capacity — Gulf Coast	2 million	5-7 million	200%
Caustic soda production — U.S. (tons)	4 million	6-8 million	75%
Caustic soda capacity — Gulf Coast	2.1 million	4-5 million	100%
Soda ash production — U.S. (tons)	5.6 million	6-8 million	25%
Soda ash capacity — Gulf Coast	1.1 million	1.6 million	45%
Elemental sulfur consumption — Gulf Coast (long tons)			
For sulfuric acid	560,000	740,000	32%
For pulp and paper	20,000	25,000	25%
As ground, roll, and stick sulfur	45,000	50,000	11%
For chemicals and miscellaneous uses	25,000	35,000	40%
Total Gulf Coast sulfur usage	650,000	850,000	31%
ORGANIC CHEMICALS			
Ethylene consumption — U.S. (lbs.)	3.6 billion	6.5 billion	81%
Ethylene consumption — Gulf Coast	2.2 billion	3.6 billion	64%
Propylene consumption — U.S. (lbs.)	1.5 billion	2.0 billion	33%
Maximum availability of petrochemical raw materials for chemical manufacturing in the Gulf Coast area in 1965:			
By-product hydrogen	465 million cu.ft./day		
Aromatics	1.5 billion gal./year		
Butylene	5.6 billion lbs./year		
Propylene	3.8 billion lbs./year		
Ethylene	12.5 billion lbs./year		

In Aromatics, a Giant Role for the Gulf Coast

(Predictions for 1965, in million gallons)

<u>Commodity</u>	<u>Gulf Coast Production</u>	<u>U. S. Demand</u>
Benzene	200	500
Toluene	155	335
C ₈ aromatics	150	300
o-Xylene	7-10	17.5

Gulf Coast's 1965 Outlook on Synthetic Rubber

Gulf Coast production as percent of U. S. total:

GR-S rubber	60%
N-type rubbers	30%
Butyl rubber	100%
Neoprene	(none)

Gulf Coast requirements for 1965 rubber production (long tons):

Butadiene	450,000
Styrene	180,000
iso-Butylene	165,000
Isoprene	5,000
Acrylonitrile	4,000

industry projects completed, under construction or planned, stage-setter John McPherson—vice-president of Jefferson Chemical Co. and co-chairman of the meeting—said it's possible that the value of chemical production in the Gulf Coast area is even now about to exceed that of the combined New York-New Jersey area.

After reciting the area's natural resources and other economic assets, President Harold Vagtborg of Southwest Research Institute (San Antonio) called upon the U.S. chemical industry to study increased use of agricultural products as raw materials.

Sulfur Use Soaring: Anticipating that many sulfur users will seek additional quantities of elemental material in preference to other forms, Jefferson Lake Sulphur Co. President E. H. Walet, Jr., predicted that world consumption of elemental sulfur in 1965 will reach 15 million long tons, nearly double '56's 7.7 million.

Walet scored the recent sulfur price reductions, emphatically declared that "higher prices are not only justified but are necessary to maintain and develop a sound sulfur industry."

Salt and Sea Water: The capital investment of that portion of the Gulf Coast's chemical industry that's based on salt and sea water appears to be "in the neighborhood of \$800 million to \$1 billion." That was the rough estimate tossed out by Dow Chemical's H. G. Roebke, assistant general manager of the company's Texas Division.

On the whole, Roebke looked for an increasingly profitable future for the Gulf Coast's brine and sea water processors. But the rate of expansion—exceptionally high since the first of the 14 plants now operating or abuilding started up back in 1934—will drop, Roebke believes, if construction and operating costs keep mounting.

Petroleum Preview: John McLean, vice-president of Continental Oil Co., had the assignment of forecasting the size and nature of the Gulf Coast petroleum industry in 1965—and he seemed to relish the chore. Speaking slowly and deliberately, McLean predicted that total U.S. demand for petroleum products will rise by about 3.7%/year to about 12.1 million bbls./day—some 36% more than the estimated daily average for '57.

Natural gas consumption in the U.S. will climb by about 4.5%/year, he estimated, bringing marketed pro-

duction to about 15.2 trillion cu. ft. in 1965—about 42% above this year's level. McLean said the Gulf Coast has contributed 23.5% of total U.S. production of liquefied petroleum gases in recent years. Should the same ratio continue, he proceeded, there will be a little more than 2.4 billion gal./year of LPG production in the Gulf area in 1965, compared with the 1.95 billion gal. available this year.

Higher Costs on Hydrocarbons: The need for petrochemical raw materials will continue to rise in the next eight years, but the petroleum industry has the potential to meet those demands. This was the assurance of General Manager Wayne Kuhn of The Texas Co.'s Research & Technical Dept., Beacon Laboratories. Accordingly, he continued, no shortage of natural gas for chemical manufacture is anticipated, but price of the material is expected to keep on its upward trend. Seeing that the current cost is about 10¢/1,000 cu. ft. compared with the 6¢ charged in 1950, he deduces that "cheaper sources of raw material will be sought for petrochemicals."

Kuhn analyzed the effects that changing refinery operations—mostly aimed at providing higher-octane fuels

—will have on availability of by-products that serve as petrochemical raw materials. For example, he sees increasing use of extraction by Udex, Arosorb or by use of sulfur dioxide as resulting in greater output of normal paraffins that should be good starting points for petrochemicals.

Panel Panorama: Rounding out the technical sessions was a panel discussion on hydrocarbon requirements for chemical manufacture, moderated by industrial chemicals consultant J. R. Mares of Houston. Their forecasts are summarized in the tables on page 40—hydrogen and aromatics by R. F. Pfennig of Humble Oil Co.; ethylene by Kendall Greene of Gulf Oil Corp.; propylene and butylenes by Shell Chemical Co.'s H. A. Mitchell; and synthetic rubbers and intermediates by Enjay Co.'s Vice-President James Park.

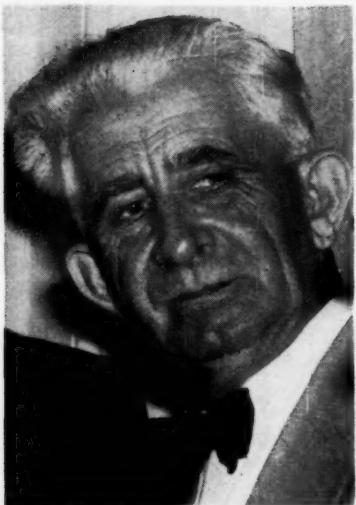
At the Western-style barbecue hosted by Dow that evening at its Lake Jackson pavilion some 55 miles from Houston, consensus among delegates was that the speakers' unanimous vote of confidence in the Gulf Coast's chemical future was amply supported by the data they had mustered for the occasion.

Digressions: Research, Pollution

Two speakers at last week's Houston meeting departed from the industry forecast theme to sound off on topics of no less concern to chemical process management.

Southwest Research Institute's Vagtborg read into the record a charge that "The U. S. has suffered its first serious setback—a setback in the vital area of scientific leadership," caused by failure to give adequate support to basic research. In a joint statement, Vagtborg and six other industrialists and educators called for broader financing of research costs, graduation of increasing numbers of scientists, and creation of an atmosphere "conducive to the advancement of science."

General Manager Kenneth Danskin, of Lubrizol Corp.'s Houston plant and co-chairman of the meeting, blasted Harris County's pollution control agency for its enforcement methods. Instead of the "fair-minded, cooperative spirit" that he says prevails in most operations of this kind, the local agency, he went on, has harassed industry with criminal and civil lawsuits that sometimes seem to be filed without sufficient evidence. Danskin declared that "If the hand of friendship and cooperation should be extended, an enlightened and responsible industry will react with astonishing quickness to show that one of its primary concerns is protection of the air and water in the community."



Durham (left), Moody: 'Will atomic power be competitive?'



WIDE WORLD PHOTOS

Reaction to Reactors

Late in December or early in January, the Shippingport, Pa., atomic reactor will start pouring power into the western Pennsylvania power grid. But its debut is being met with sharp criticism from both industry and government sources. This challenge to federal subsidies for atomic power—which will have to be faced in the next session of Congress—is giving chemical management new grounds for wariness about venturing into atomic-materials processing.

Most recent slash-the-subsidies attack came last week from Joseph E. Moody, president of the Southern Coal Producers Assn., a long-standing, outspoken A-power critic. He termed the Shippingport plant an "outstanding example of idiocy."

Moody's latest outburst is based on familiar data: Shippingport, according to Admiral H. G. Rickover, chief of the naval reactors branch of the Atomic Energy Commission and director of the project, will produce power at a cost of possibly 65 mills per kilowatt hour.

Duquesne Light Co., in partnership with AEC on the project, will buy the power for eight mills. The government will bear the additional cost, and this, says Moody, could run up to \$24 million/year.

But reactor men point out that Moody's figure was arrived at by using all extraordinary costs connected with the reactor. Many ex-

penses—such as research, feasibility tests, and molding nonstocked parts—won't recur if similar reactors are built later on, they say.

To indicate how much atomic power will cost under normal conditions, reactor men cite the abuilding Consolidated Edison (New York) reactor, due to start producing in 1960. Power from Con Ed's reactor will cost only 13 mills/kwh.—and it's likely that costs will get lower as operating and fuel reprocessing problems are solved. Atomic power costs are now substantially higher than power by conventional methods, which ranges from 4 to 8 mills/kwh.

Cost Turnabout: Some legislators have latched onto the high cost factor as support for their argument that the government should build large-scale atomic plants because private industry can't afford to take the loss. Rep. Carl Durham (D., N. C.), chairman of the Congressional Joint Committee on Atomic Energy, argues that this country must build such plants to keep pace with developments in Britain and Russia.

The Opposition: Coal interests—and some members of Congress—have fought this point of view on the grounds that it means federal subsidies for a competing fuel. Coal reserves, they claim, are such that this country won't need atomic power for many years. But they aren't opposed to a broad atomic research program.

New Division for UCC

Union Carbide Corp. has set up a new division to handle growing demands for unsaturated hydrocarbons.

Called Union Carbide Olefins Co., the new division will be an autonomous operation, distinct from Union Carbide Chemicals Co., which up to now has been handling production and sales of all chemicals, including olefins.

In effect, however, the change is more organizational than physical. No new plants will be built, materials will come from existing plants operated by Union Carbide Chemicals Co. But the new company will take over the production, sales, purchasing and engineering operations connected with ethylene, propylene, butadiene and analogous hydrocarbons.

Carbide points out that olefins have been a major part of the company's business since 1920, when Carbide started producing them at Clendenin, W. Va.

As president of the new firm, Carbide named H. D. "Sox" Kinsey, long-time engineer-employee who started his career at the Clendenin plant.

Tax Ruling Awaited

Before year-end, the U.S. Internal Revenue Bureau is likely to come out with a tax ruling that may be of considerable moment to business in general and to the Du Pont company and stockholders in particular.

Late last week in Chicago, following a hearing on the Supreme Court-ordered redistribution of Du Pont's 63-million-share holdings in General Motors Corp., Federal District Judge Walter La Buy approved a motion filed by Du Pont and GM attorneys that the Revenue Bureau be asked to decide on tax liabilities under the stock disposal plan recently proposed by the Justice Dept.

That plan suggests that Du Pont's GM shares be placed in trust, with some to be distributed to Du Pont stockholders and the remainder to be sold over a 10-year period. Proceeds would go to Du Pont stockholders.

Du Pont and GM want to know if those payments would be treated as tax-free distributions, as dividends, or as payments in partial liquidation. Du Pont attorney Andrew Dallstream said about \$1 billion in taxes is involved.

FOREIGN

Chemicals/Germany: While over-all chemical industry sales in West Germany increased 10-12% during 1956, Farbwerke Hoechst AG. (Frankfurt) reports a 16.6% rise to \$353 million. Of that total, exports accounted for 30%, or \$106.9 million. New capital investments—\$57.6 million in '56—are expected to total more than \$47 million for '57. Research expenditures rose from \$16.4 million in '55 to \$19.3 million in '56—5.4% of sales. Since '52, the company's employment total has climbed from 26,189 to 39,615.

Chemicals/China: In Red China, the Communist party's Central Committee has severely criticized the country's chemical industry as "backward" and "lagging." The party's official newspaper says that last month's opening of the Russian-built, three-plant chemical complex at Kirin in northeast China was "only the first step" of the long march that the chemical industry there must take to meet "the growing demand of our national economy."

Fertilizer and Heavy Water/India: India's state-owned Nangal Fertilizer and Chemical Ltd. has contracted with the French chemical concern St. Gobain (Paris) to construct a \$15-million fertilizer plant at Nangal in East Punjab, with "favorable deferred payment terms." Scheduled annual capacity by '60 is 395,000 tons of nitrogen- and lime-containing fertilizers. This plant, and an adjoining unit to make 12-15 tons/year of heavy water, will get water and electric power from the nearby Bhakra-Nangal river valley project.

EXPANSION

Plant Engineering: Chemical Construction Corp. (New York) has started construction of a new development center in New Brunswick, N.J. The unit will house Chemico's laboratories for bench and pilot-plant-scale testing, replacing the company's pilot-plant operations at Linden, N.J. It's scheduled for completion in June '58, when Linden employees will be transferred to New Brunswick.

Epoxy Resins: Construction of Ciba Co.'s new epoxy resins plant and laboratories in Toms River, N.J., is under way. Scheduled to be onstream in mid-'59, the new installation will replace the resins and plastics units of Ciba's plant at Kimberton, Pa.

Feldspar: Spar-Mica Corp. (Baie Johan Beetze, Que.) last week started exporting feldspar concentrate from its \$4-million mining operation in the remote St. Lawrence Gulf community of Baie Johan Beetze, 700 miles northeast of Montreal. Reportedly, it was the first bulk shipment of feldspar from Canada.

Perlite: Great Lakes Carbon Corp.'s Mining and Mineral Products Division has started limited mining operations at its No Agua deposit of crude perlite in northern New Mexico. Ore will be processed at Great Lakes' Florence, Colo., plant until completion of a new crushing and sizing plant near the deposit in mid-'58.

Plastics: Shell Chemical Corp., subsidiary of Shell Oil, is surveying a 200-acre site near Riverside, N.J., where it may build a multimillion-dollar plastics plant. The company is checking the site for suitability of producing synthetic resins and allied products.

Platinum: Miracle Mines, Ltd. (Denver), will start producing platinum from ores discovered near Walden, northwestern Colorado. Miracle estimates that the ore will bring \$9-50/ton, and on this basis, company officials say, reserves are worth about \$300 million.

COMPANIES

American Marietta Co. (Chicago) has agreed to purchase Niagara Pipe Ltd. (St. Catherines, Ont.) through an exchange of stock. The Chicago firm, besides taking over Niagara's concrete plant in the St. Lawrence Seaway development area, will build an additional plant in Toronto.

Merichem Co. (Houston), an affiliate of Jefferson Lake Sulphur Co., has purchased Brin Chemical Co. (West Tulsa, Okla.) for an undisclosed sum. A Merichem official said the company will develop the Brin plant into "a petrochemical manufacturing concern, which will operate throughout Oklahoma and Kansas." Present plans call for a tripling of Brin's cresylic acid output.

Air Products Inc. (Allentown, Pa.) has acquired all the assets of Kemsco, Inc. (Torrance, Calif.), through a cash transaction. Kemsco will continue to produce liquefied gas pumps and to research special low-temperature equipment, supplementing Air Products' present work in that field. The California firm will be operated as a wholly owned subsidiary of Air Products.

H. K. Porter Co. (Pittsburgh) has purchased Bond Brothers Inc., which makes railroad ties and operates a large creosoting plant in Louisville, Ky., for \$5 million. Bond Brothers will continue operating as a division of Porter.

Canadian Industries Ltd. is offering \$20 million worth of 5 3/4% debentures through a syndicate headed by A. E. Ames & Co. Ltd. (Montreal). Proceeds from the sale will be used to retire a bank loan and to build new or expanded facilities at Edmonton, Hamilton, Copper Cliff and Beloeil.

Using Salt Efficiently

by INTERNATIONAL SALT COMPANY, INC.—America's largest producer of salt



How to Find the Strength of Salt Brines—Accurately

In most of today's plants, the type of hydrometer called a Salometer can generally be used to measure the strength of salt brines most accurately. This device (similar in principle to the hydrometer which checks the condition of your car's battery) is convenient to use—and its scale permits fast calculations for a variety of plant needs. The Salometer scale reads from 0° in pure water to 100° in saturated brine, with each degree representing a percentage of fully saturated brine.

Using the Salometer with maximum accuracy, however, isn't just a matter of reading the scale.

A number of simple precautions must also be taken to make sure the Salometer records correct brine strength. Here they are:



1. Check the temperature of the brine. Since most Salometers are calibrated for reading at 60° F., brine temperature should be kept at this level during testing. When other brine temperatures are encountered, it is necessary to use the following table of simple correction factors. These will help provide a completely accurate measurement of brine strength.

APPROXIMATE CORRECTION IN SALOMETER DEGREES

Observed Salometer reading	Subtract per degree below 60° F.	Add per degree above 60° F.
0 to 10	0.049	0.060
11 to 20	0.064	0.082
21 to 30	0.077	0.094
31 to 40	0.087	0.103
41 to 50	0.095	0.112
51 to 60	0.102	0.118
61 to 70	0.107	0.123
71 to 80	0.112	0.128
81 to 90	0.116	0.131
91 to 100	0.120	0.134

For measuring cold brines, such as those used in meat-packing plants, special 38° F. Salometers may be used. Special temperature-correction factors are available when using this type of Salometer to test brines above or below 38° F.

2. Brine should be tested only in a straight-walled cylinder made of clear glass—set on a level surface. Any moisture that collects on the outside of the cylinder should be wiped off before testing procedures start.

3. Salometer stem must be thoroughly dry, clean, and free from grease or caked salt crystals. Also, the Salometer should not touch the sides of the cylinder when readings are taken. It should be read with the stem in a vertical position.

4. Check new Salometers by placing them first in clear water; reading should be 0° S. Then empty the cylinder, rinse with a saturated salt solution, and refill

5. Correct reading technique. Brine tends to rise along the sides of a glass cylinder, forming a concave surface known as a meniscus. For correct reading, the eye should be brought to a point level with the bottom of this meniscus. Errors of two or three degrees are possible if reading is taken at the point where the brine has risen along the sides of the cylinder.

Special Salometers. In the canning industry, where brine is used for quality grading, a different type of Salometer is often used. It's graduated on a scale where 100° S. represents brine containing 25% salt, instead of the normal 26.395%. Special hydrometers may also be used in the tanning or chemical industries. But the same procedures outlined here must always be followed when brine is to be tested—no matter what type of hydrometer a plant uses.

TECHNICAL SERVICE WITH YOUR SALT



Through skilled and experienced "Salt Specialists," International can help you get greater efficiency and economy from the salt or brine you use. International produces both Sterling Evaporated and Sterling Rock Salt in all types and sizes. And we also make automatic dissolvers in metal or plastic for both kinds of salt. So we can recommend the type and size of salt most perfectly suited to your needs.

If you'd like help on any problem concerning salt or brine—or further information on testing brine strength—contact your nearest International sales office.

International Salt Co., Scranton, Pa.
Sales Offices: Atlanta, Ga.; Chicago, Ill.; New Orleans, La.; Baltimore, Md.; Boston, Mass.; Detroit, Mich.; St. Louis, Mo.; Newark, N. J.; Buffalo, N. Y.; New York, N. Y.; Cincinnati, Ohio; Cleveland, Ohio; Philadelphia, Pa.; Pittsburgh, Pa.; Richmond, Va.

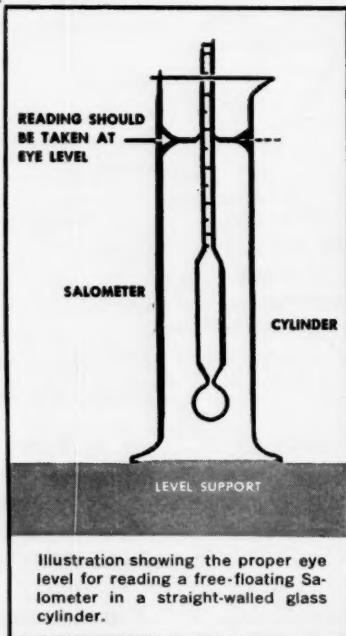


Illustration showing the proper eye level for reading a free-floating Salometer in a straight-walled glass cylinder.

with fully saturated brine; reading should be 100° S. Both water and brine should be at 60° F.

FOR INDUSTRY, FARM, AND THE HOME—

STERLING SALT

PRODUCT OF INTERNATIONAL SALT CO., INC.

Washington Newsletter

CHEMICAL WEEK
November 30, 1957

Impact of the turnaround on defense spending is being felt.

Eisenhower has torn up his directive to the Pentagon to keep next year's spending to \$38 billion; now, the lid's off on service spending. But increases will be highly selective—and will be partly covered by economies elsewhere: e.g., closing of some overseas bases, release of more servicemen.

Near-term spending increases won't be particularly large—but

there's virtual unanimity among all observers that the Pentagon spending total will continue to rise. It will surely go to \$40 billion, perhaps by the end of fiscal year '59, which begins next July 1. Officials inside and outside the government predict a rise to at least \$43-44 billion within three years. Some responsible Congressional officials say that by the time the turnaround finally works its course—perhaps over a three- to five-year period—the Pentagon's spending may be close to \$50 billion/year.

More funds will be allotted to missiles procurement.

The only question is how much more. A hint comes from Air Force Chief of Staff Gen. Thomas D. White—he says the Air Force alone will spend \$2.5 billion on missiles output next year—that's as much as all three services are spending now. AF takes a \$1.7-billion slice of today's missiles procurement funds, about two-thirds of the \$2.5-billion total. If other services get proportional boosts, the fiscal '59 total will hit about \$4 billion.

The IRBM rivalry between the Air Force's Thor and the Army's Jupiter complicates the picture. (IRBM is short for intermediate-range ballistic missile.) A decision on which of these weapons will be put in production (the other will be killed) is due before July 1—the start of fiscal '59. Feeling is that General White anticipates a victory for Thor advocates in projecting a doubled missile procurement budget for the Air Force. Since he won't confirm or deny this, his figures may not be a reliable barometer for estimating total Pentagon spending on missiles production.

No matter how the decision goes, the fuel picture won't be changed much. Thor and Jupiter are designed to use the same liquid-fuel rocket engine (North American Aviation's Rocketdyne Division has rocket system contracts for both IRBMs). Moreover, the Navy foresees a modest hike in funds for its IRBM—the solid-fuel, ship-launched Polaris (Aerojet-General is producing the Polaris engine). Polaris had been scheduled to become operational in 1960-61; that target date has been advanced with the turnaround on funds.

The chemical bomber's status is still uncertain—ditto for the nuclear airplane. The Air Force has evaluation teams at Boeing and North American Aviation—reportedly will give one of these firms a prime contract by Dec. 31 for a prototype chemically fueled bomber. But new funds

Washington Newsletter

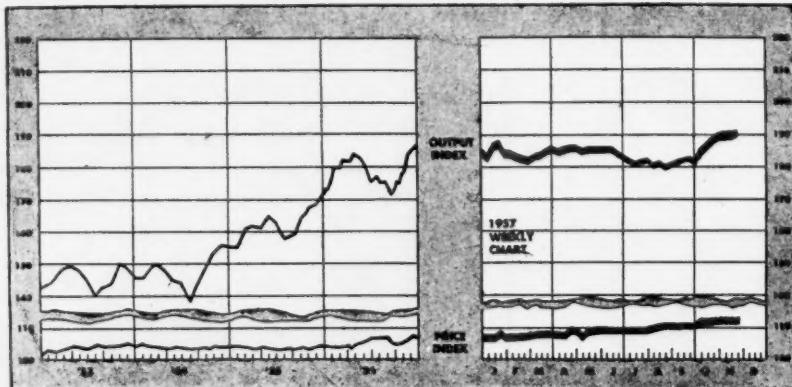
(Continued)

for chemical- and nuclear-fueled planes were killed by Pentagon higher-ups (there's some nuclear bomber money in AEC's budget, however) before Eisenhower lifted the ceiling on '59 defense spending. Expectation is that the money will be restored.

The Federal Reserve's credit liberalization is only the beginning of Washington's actions to offset the business slide. It's the first tangible action aimed at reassuring businessmen that Washington will react in time to prevent business softness from growing into a real recession.

More helium capacity is in the works. Interior Secy. Seaton is dickering for Budget Bureau approval of a \$14-million request to Congress for a new 240-million-cu.-ft./year helium extraction plant. Budget officials want to hold the amount to \$10 million. Seaton's proposal would boost U. S. capacity to 600 million cu. ft./year by '60—meet anticipated increases in demand through '63.

The government is working on a helium conservation policy (about 90% of current production of helium is burned up with marketed natural gas). A committee report is due Dec. 31 on these proposed solutions: (1) a government fiat to halt natural gas output from fields lacking helium plants (such fields now supply 15 million Midwesterners, but other wells could take up the slack; (2) extensive helium plant building by government or industry—the latter, if a way is found to overcome industry's reluctance to buy into this field.



Business Indicators

WEEKLY

	Latest Week	Preceding Week	Year Ago
Chemical Week output index (1947-49=100)	190.0	190.5	183.3
Chemical Week wholesale price index (1947=100)	111.2	111.2	106.6
Stock price index of 11 chemical companies (Standard & Poor's Corp.)	38.83	37.97	41.64

MONTHLY

Production (Index 1947-49=100)

	Latest Month	Preceding Month	Year Ago
All manufacturing and mining	147	145	151
All chemical products	189	185	182
Industrial chemicals	210	206	198

U.S.I. CHEMICAL NEWS

November 30 ★

A Series for Chemists and Executives of the Solvents and Chemical Consuming Industries

★ 1957

U.S.I. Joins Mallory And Sharon in Integrated Company to Produce Zr, Ti

U.S.I. will soon join in the management of Mallory-Sharon Titanium Corporation which will change its name to Mallory-Sharon Metals Corporation. The reorganized company will then produce zirconium and titanium metals and mill products, and other special light metals such as hafnium. Each of the following companies owns a one-third interest in the new enterprise: National Distillers and Chemical Corporation (U.S.I. Division), P. R. Mallory & Co., Inc. and Sharon Steel Corporation.

All assets of both the Mallory-Sharon Titanium Corporation and Reactive Metals, Inc., as well as USI-National Distillers' zirconium plant and forthcoming titanium plant will be combined in the newly formed corporation. With assets exceeding \$55 million, the new company will be the largest fully integrated producer of special metals.

Presidents of the three owner companies have made this joint statement: "This consolidation of interests creates a completely integrated special metals company with technical 'know-how' and facilities for every step, from original chemical process to production and fabrication of finished products. The benefits from this strengthening of operations, plus the combination of current and future research activities, hold great promise for present production of titanium and zirconium and for other special metals as well."

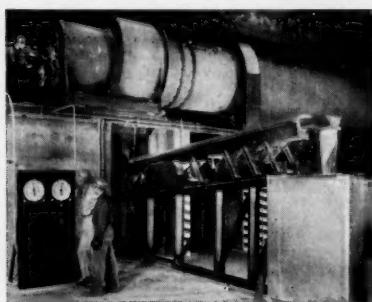
Zirconium Metal Plant Starting Up

In 1956 U.S.I.-National Distillers was awarded a contract by the Atomic Energy Commission to supply one million pounds of zirconium metal annually for a five-year period. A plant was designed and built at Ashtabula, Ohio with a design capacity of 2 million pounds per year, and the plant is now in process of being started up. Hafnium sponge and oxide will also be produced as an adjunct to the zirconium operation.

A titanium sponge plant with a design capacity of ten million pounds per year is under construction at Ashtabula.

Both of these plants have been designed to utilize a new sodium-reduction process developed by U.S.I.-National Distillers. It is

MORE ➤



Zirconium oxide kiln in chemical processing section of Mallory-Sharon Metals Zr plant.

Methionine Given After Exposure Reduces Damage From Radiation

Report Is First Evidence of Methionine's Effectiveness Against Tissue Breakdown When Given After Exposure to Radiation

New experimental evidence indicates that the sulfur amino acid, methionine, is even more effective in reducing tissue damage caused by radiation when administered *after* radiation exposure than it is when given *before* exposure.

Brightness Is Controlled By pH in Sodium Peroxide Bleaching of Groundwood

A recently reported investigation into the fundamental chemistry of bleaching groundwood with sodium peroxide indicates that reaction rate and pulp brightness increase with pH. However above a certain pH, a colored compound is formed which tends to yellow the pulp. Therefore there is, in commercial practice, an upper pH limit for the production of pulp having maximum brightness.

Brightness Development in Sodium Peroxide Bleaching of Groundwood			
pH	Time to reach max. brightness, min.	Effective peroxide consumption, g./l.	Maximum brightness, %
9.0	180	0.10	57.1
10.0	130	0.33	59.3
10.5	110	0.47	60.2
11.0	80	0.53	60.7
11.5	70	0.53	60.2
12.0	40	0.56	60.4
12.5	20	0.48	59.2

Sodium peroxide bleaching of groundwood has been used for some time by pulp makers. It produces a relatively large increase in brightness at low cost, without affecting pulp quality adversely or decreasing yield materially.

This study reveals that the rate of total peroxide consumption increases as pH rises from 9 to 12, due largely to the increased rate of the peroxide-groundwood reaction. The rate at which peroxide decomposes to form oxygen also goes up with pH, but this is minimized by materials in the groundwood and by adding stabilizers.

It was also learned that the rate and amount of brightness improvement increases with pH. Yellow color, mentioned previously, increases at the same time, the effect being more pronounced toward the end of the bleaching period. It causes reversion of brightness in some cases.

The most effective bleaching under the conditions used by the investigators was obtained at pH 11. Here the peroxide-groundwood reaction is fast enough, in relation to the decomposition reaction, to give appreciable bleaching in the first third of the bleaching period. On the other hand, the pH level is not high enough to produce excessive color shift and brightness reversion.

Sodium peroxide for groundwood bleaching is made from metallic sodium at U.S.I.'s plant in Ashtabula, Ohio.

Earlier reports have demonstrated methionine's ability to protect experimental animals from the effects of subsequent exposure to X-ray irradiation (U.S.I. CHEMICAL NEWS, Sept.-Oct., 1955). The present work, reported in a leading English scientific journal by Indian scientists working in Bombay, is believed to be the first to show methionine's post-irradiation effectiveness.

In the tests, deoxyribonucleic acid (DNA) levels in the liver, spleen and bone marrow were used as a measure of the extent of radiation damage. DNA is the substance in the nucleus of all cells believed to carry the mechanism of heredity. The researchers found that DNA levels in untreated animals were reduced by as much as 87% after exposure to radiation. DNA in methionine-treated animals was reduced to only about one-half of pre-exposure levels.

Methionine administered prior to irradiation afforded a considerable amount of protection, but was less effective than post-irradiation treatment. The radiolability of methionine—its tendency to be destroyed by ionizing radiations such as X-rays—is believed to account for this reduced effectiveness.

In evaluating the pre- and post-irradiation effectiveness of methionine, however, it should be noted that in the recent work methionine was given intraperitoneally. It has been reported (U.S.I. CHEMICAL NEWS, July, 1957) that radiation can cause a decrease in the ability of the body to absorb methionine that has been fed orally.

Methionine Aids Nucleic Acid Synthesis

The specific means by which methionine acts to prevent tissue damage from radiation is related to the nucleic acid synthesizing mechanism itself. Methionine is known to play a part in two chemical processes which are involved in the production of DNA—transmethylation and phosphorylation. (Methionine is a principal source of methyl groups for the animal organism and is a precursor of creatine, which is active in the phosphorylation process.) Thus, by aiding two of the essential routes by which nucleic acids are made, methionine keeps the synthesizing mechanism in order and exerts a therapeutic influence on radiation injury.

The considerable amount of research that has been done on methionine's effectiveness in minimizing radiation damage stems from methionine's well known ability to promote healing of wounds and burns. It is also a detoxifying agent through its action on the liver.

MORE ➤

November 30 ★

U.S.I. CHEMICAL NEWS

★ 1957

CONTINUED

Methionine

Methionine also is known to improve feathering in poultry and hair coat quality in fur bearing animals. As the only sulfur-containing essential amino acid, it is widely used in the manufactured feed industry as a protein supplement to promote growth and health in livestock and poultry.

The first commercial synthesis of methionine, which has led to its widespread use in medical and animal feed applications, was pioneered by U.S.I.

CONTINUED

New Company

believed to be the lowest cost method developed to date for the production of these metals. Mallory-Sharon Metals will be granted an exclusive, royalty-free license in the U. S. for the production of titanium, zirconium and other metals by this process.

Sodium is supplied by the existing

U.S.I.-National Distillers sodium operation three-quarters of a mile away. At Ashtabula, Mallory-Sharon Metals will also have facilities for melting zirconium metal into ingots. Titanium sponge will be melted and both metals fabricated at the existing Mallory-Sharon plant at Niles, Ohio.

High Purity Silicon Being Made Via Sodium Reduction

High purity metallic silicon for electronics use in semi-conductor devices is now being produced by the sodium reduction of silicon tetrachloride. The product contains boron in the order of two parts per billion, and has resistivities up to 500 ohm-centimeters.

Several thousand pounds of the material have already been manufactured in one plant overseas, and indications are that this process is more economical than either hydrogen reduction of silicon tetrachloride or reduction of silicon monoxide.

TECHNICAL DEVELOPMENTS

Information about manufacturers of these items may be obtained by writing U. S. I.

Polyethylene packaging materials are illustrated in a recent brochure. Bags, sheets, drum-liners and pressure-sensitive tapes are described, as well as water vaporproof, flexible and protective wraps made of barrier material. **No. 1291**

Buffer salts in disposable packets are now available. Each packet is carefully weighed, has been lot-analyzed for purity. Contents dissolved in a litter of water provide a ready-to-use buffer solution. **No. 1292**

Tape entry to computers is facilitated by a new machine with internal core storage, which gathers asynchronous digital information from external sources and combines them in any sequence with record numbers and manually inserted data. **No. 1293**

A new pamphlet on zirconia discusses the history, the chemical and physical properties, the composition, and the porosity of the chemical. Included is a refractory comparison chart. **No. 1294**

A calibrated dispenser delivers a specific volume of liquid from 1 cc. to 100 cc. rapidly and repeatedly. Measurement is automatic, said to be accurate to within 1%. Can be used for volatile, toxic, or alkaline liquids. **No. 1295**

Two monomeric ester-type plasticizers are said to be useful for safety glass, synthetic rubbers and lacquers, and as plasticizers for cellulose acetate butyrate, polystyrene, acrylic resins and ethyl cellulose. **No. 1296**

A pamphlet on fire research reports of the facilities, personnel and management of the principal agencies engaged in this work. It also describes tests of various materials and fire-protection systems. **No. 1297**

A polyethylene pump is now being made for use with inflatable boats and mattresses. Air is trapped inside the bag by folding the top together, and forced into the mattress through a valve by compressing the bag. **No. 1298**

Oleoresin mace, a new spice oleoresin, is described as a dark, reddish-brown, homogeneous liquid, and is said to be completely solvent-free. It contains from 50 to 60 cc. of volatile oil per 100 grams net. **No. 1299**

A new nickel stripper is reported to contain no cyanide, caustic or acid, and to be stable over long periods of time, even at high temperatures. Manufacturer claims it will not fume, pit or corrode. **No. 1300**

PRODUCTS OF U.S.I.

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Riboflavin USP
Urethan USP
Intermediates

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Intermediates and Fine Chemicals: Acetoacetanilides, Dimethyl Hydrazine, Ethyl Acetoacetate, Ethyl Benzoylacetate, Ethyl Chloroformate, Ethylene, Ethyl Chloride, Ethyl Sodium Oxalacetate, U.S.I. ISOSEBACIC® Acid, Methyl Hydrazine, Sodium Ethylate Solution, Triethyl Aluminum, Trimethyl Aluminum, Urethan USP (Ethyl Carbamate).

Animal Feed Products: Calcium Pantothenate, Choline Chloride Products, MOREA® Premix, Special Liquid Curby®, D.L-Methionine, Niacin USP, Riboflavin Concentrates, Vitamin B₁₂ and Antibiotic Feed Supplements, Vacatone® 40, Vitamin D₃ and K₃ Products, Antioxidant (BHT) Products, Special Mixes, U.S.I. Permadry Products (Sealed-In Vitamin A).

Inorganic Chemicals: Ammonia, Caustic Soda, Chlorine, Metallic Sodium, Sodium Peroxide, Sulfuric Acid.

Metals: Titanium Sponge, Zirconium Sponge, Zirconium Platelets, Hafnium Oxide, Hafnium Sponge.

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Division of National Distillers and Chemical Corporation
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Why a Buyer Blows His Top

There is growing indication this week that many chemical suppliers are losing business because of a lack of general service contact with customers and a lack of good all-round salesmanship.

One large-volume chemical purchasing agent put it this way: "These days, quality and price of a given product are standardized throughout the industry. So, all the supplier is really selling is service. But in too darn many cases, this is the most neglected part of the buyer-supplier relation."

That problem turns up repeatedly in a new *CHEMICAL WEEK* nationwide spot-check of chemical purchasing agents, who are fast becoming hot-under-the-collar. Major complaints:

- Inability to get action from suppliers on service problems.
- Salesmen who talk about too many products—some mention as many as 75 at a sitting.
- The salesman who "happens to be in the neighborhood" and drops in without an appointment.
- Salesmen who call, knowing nothing about the buyer's needs, products or policies.
- Salesmen who try to sneak sales through via the "back door."

Blame Both: Buyers blame both salesmen and their sales managers for headaches engendered by poor "followup service" from large companies.

The situation often develops like this: a buyer gets a frantic call from the plant reporting that quality of a supplier's products is off, or that delivery is running late. The purchasing agent tries to phone the salesman, but more often than not the salesman is out—selling. A call to the supplier's office often brings a fast shuffle from department to department. When he hangs up the phone, the buyer usually isn't sure the people he talked with will give him immediate action on his problem.

One solution noted in the *CW* survey: buyers recommend that salesmen give them the name and phone number of a man in the supplier's office who knows the account, and cares enough to give fast, complete service. Buyers speak warmly of companies that have offices staffed with "inside salesmen" who give the impression that they are there for the sole purpose of servicing accounts.

Time, the Essence: Buyers agree that most of their problems with individual salesmen can be tied to a single factor—time. Purchasing agents just don't have enough hours in the day to see all the salesmen who call, and still have enough time left for their other



"I don't have an appointment, I happened to be in the neighborhood, and. . ."

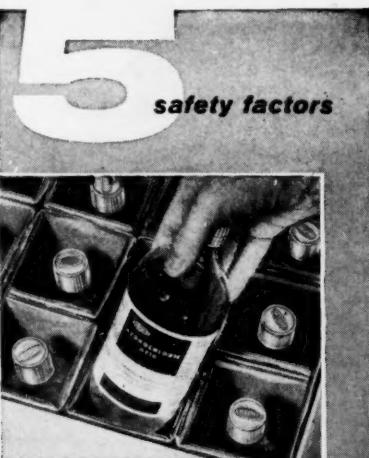
"So I'm sittin' there, and here comes the most gorgeous blonde. . ."

"Well, I don't know much about that item, but product No. 47 here . . ."

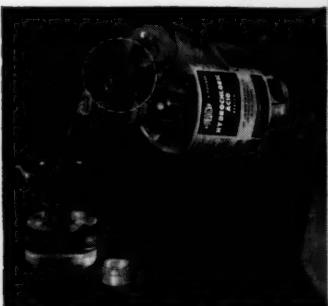
"Service? Didn't the office handle it?"

"What! You're canceling?"





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Safety factor 2—Safety grip for pouring from 5-pint bottles.

Safety factor 3—Dripless sleeve on pouring lip of all 1-pint and 5-pint bottles.



Safety factor 4—Throw-away bottles and cartons reduce possibility of improper re-use. One man can safely handle these light cartons.

Safety factor 5—Color-coded caps and labels.

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*Throw-away bottles in 5-pint size only.

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Du Pont Reagents, both 1-pint and 5-pint sizes, are packed in single-trip bottles and cartons for extra convenience and economy. Benefit from these advantages:

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● SAFETY GRIPS

These new safety grips on all 5-pint bottles provide a secure and convenient hold for lifting and pouring...a definite safety factor that will help prevent spills and burns.

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S A L E S

duties. Most of the purchasing agents contacted report that the number of sales calls has increased since last year—some say as much as 30-50%.

How often should a salesman call? Opinion varies widely, but most purchasing agents suggest that routine calls should be held to less than 12 per year. But almost all buyers tell CW they are happy to see a salesman anytime if he has something new to sell or discuss.

Purchasers blame sales managers for unnecessary "missionary" calls.

The appointment system is another moot point. About half the chemical buyers CW contacted prefer that salesmen phone a day in advance of an interview; about 50% like for the salesman to phone a few hours in advance. Very few look kindly on the salesman who drops in with no advance notice.

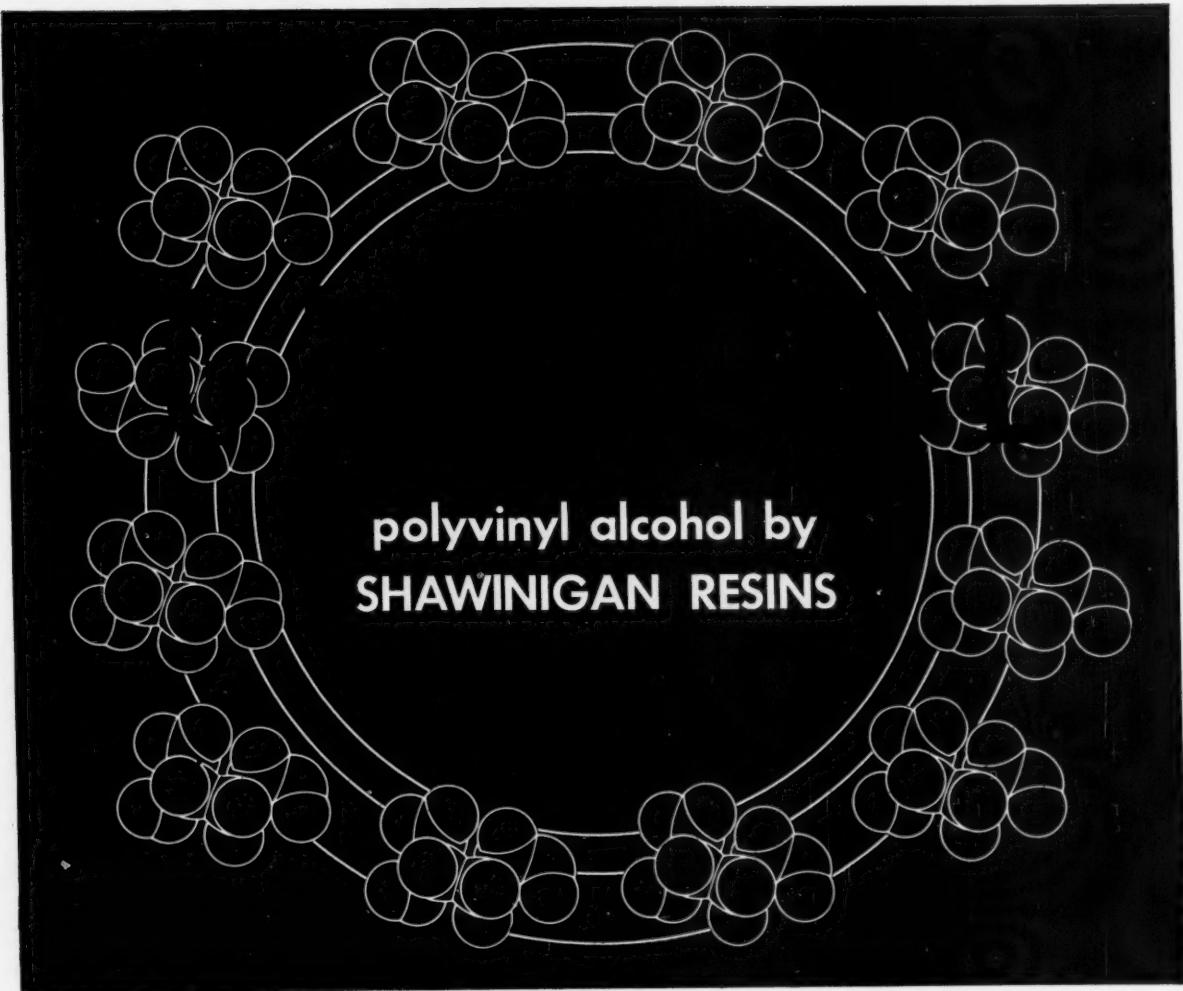
It's difficult for a purchasing agent to control the number of salesmen calling on him, but he can limit length of the interview itself. That's why the majority of buyers agree that the length of the average sales presentation hasn't increased with greater sales competition.

Though few buyers keep an eye on the clock, most of them sense a proper time for ending the interview, then drop a hint to the salesman. And they report that chemical salesmen are quick to take the hint. This system gives an average interview time of 15-20 minutes.

Too Many Products: Once the salesman gets into the buyer's office, how much ground should he try to cover? Most purchasing agents report that today's salesmen often talk about too many products. Virtually all of the survey respondents say the maximum number of products or product groups discussed at a sitting should not exceed six. Many prefer that discussion be limited to three.

Another time-waster is the salesman who spends the first 10 minutes talking about baseball, the weather and the pretty receptionist before getting down to business. Says one buyer: "I know that chemical sales are still handled largely on a personal basis, and a salesman needs an opener of some kind. But he can save my time and his own by keeping the small talk as brief as possible."

Another potential order-killer is the salesman who "just happened to



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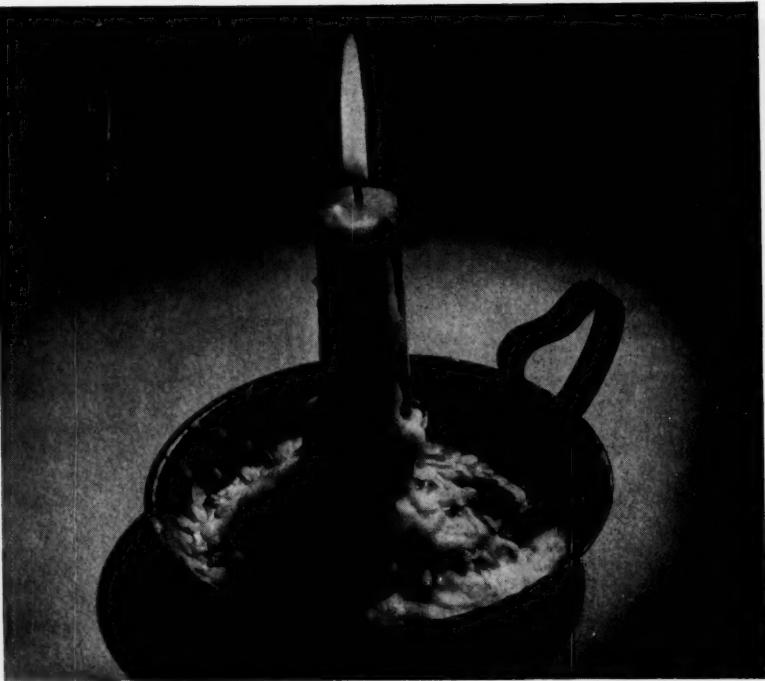
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SALES

be in the neighborhood" and thought he'd drop in. Purchasing reaction to this fellow is often violent: "If that's all the reason he has for coming in, then he shouldn't waste my time. There are men waiting in the reception room with ideas, trade news, or new products to be discussed. Why make them wait while I talk with a fellow who just happened to be in the neighborhood?"

Purchasing agents today are complaining that salesmen too often call on them with no idea of the buying company's needs, products or policies. To offset this problem, many buyers keep company booklets on reception-room tables to give salesmen a quick rundown while they wait for an interview. Still, they find these booklets are too often ignored.

Most buyers feel that a salesman, before calling, should find out what the company makes and what general product types it buys. But, perhaps more important, the salesman should know the history of relations between his and the buyer's company—what volume does the buyer already do with the salesman's company, and vice versa.

The Back Door: One-third of the buyers surveyed admit they have problems with back-door selling (*CW*, March 9, p. 126). Some situations begin when a man in the plant clips a coupon from a supplier's trade magazine advertisement. This gives salesmen valuable names and addresses, which they follow up with a letter or phone call. Other back-door problems begin when salesmen meet chemists at trade meetings.

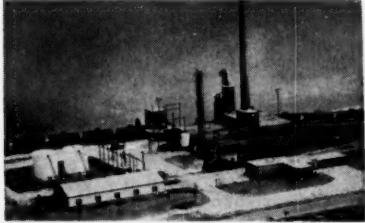
The back-door problem isn't an overwhelming one (no buyer reported more than 5% of sales being made in this way), but it is a headache for some.

Less than half the companies covered have a definite management policy condemning back-door deals. And interestingly enough, those who do have set rules report less trouble with this problem.

Time and Temper: Most purchasing agents realize that the salesman is there not only to sell a product but also to help the buyer do the best possible job. And the main tip they offer salesmen is, "If you want to help the purchasing agent, help him save his time and temper—both before and after the order is placed."



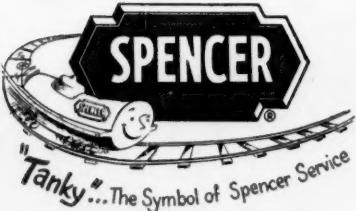
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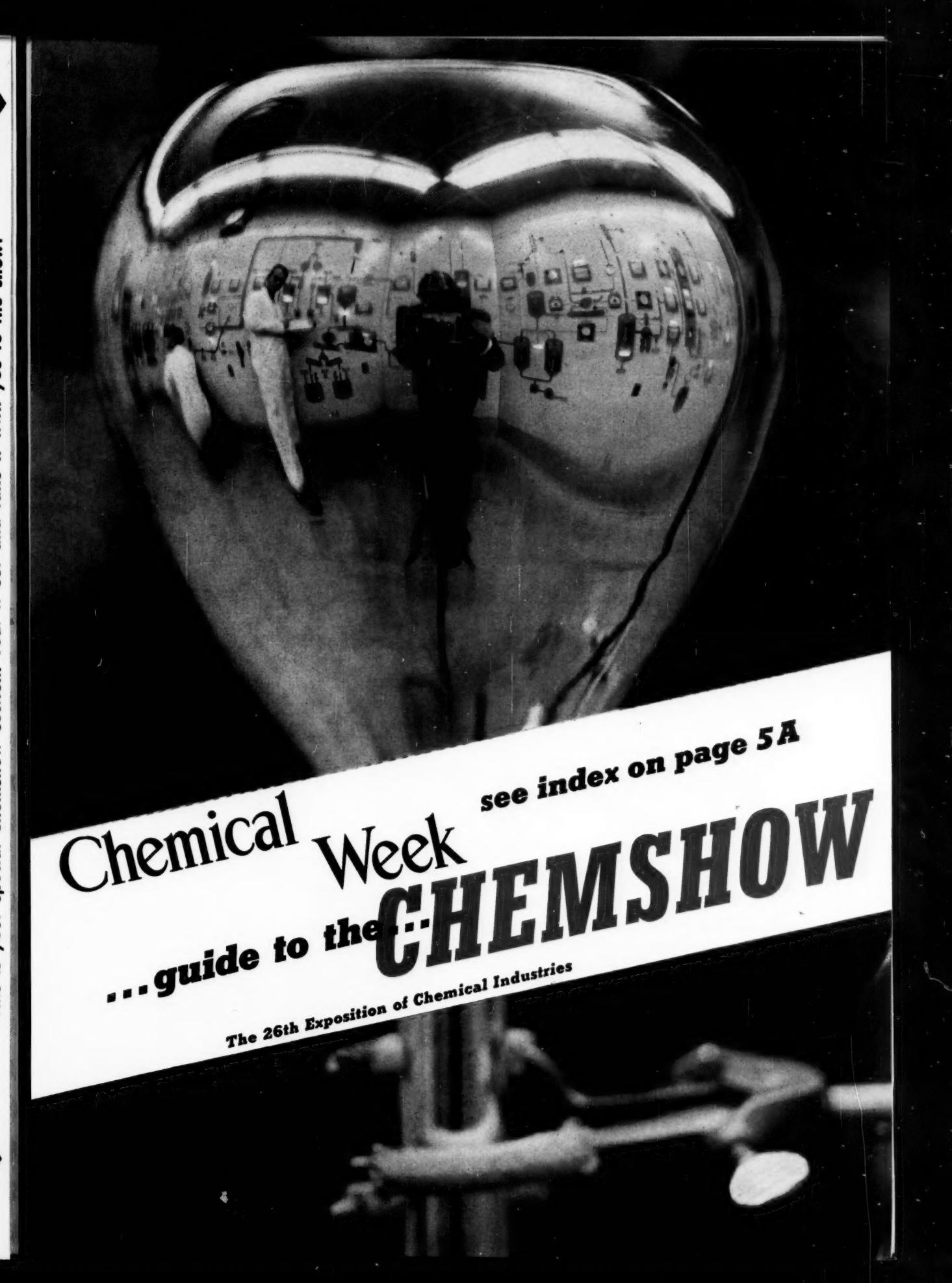
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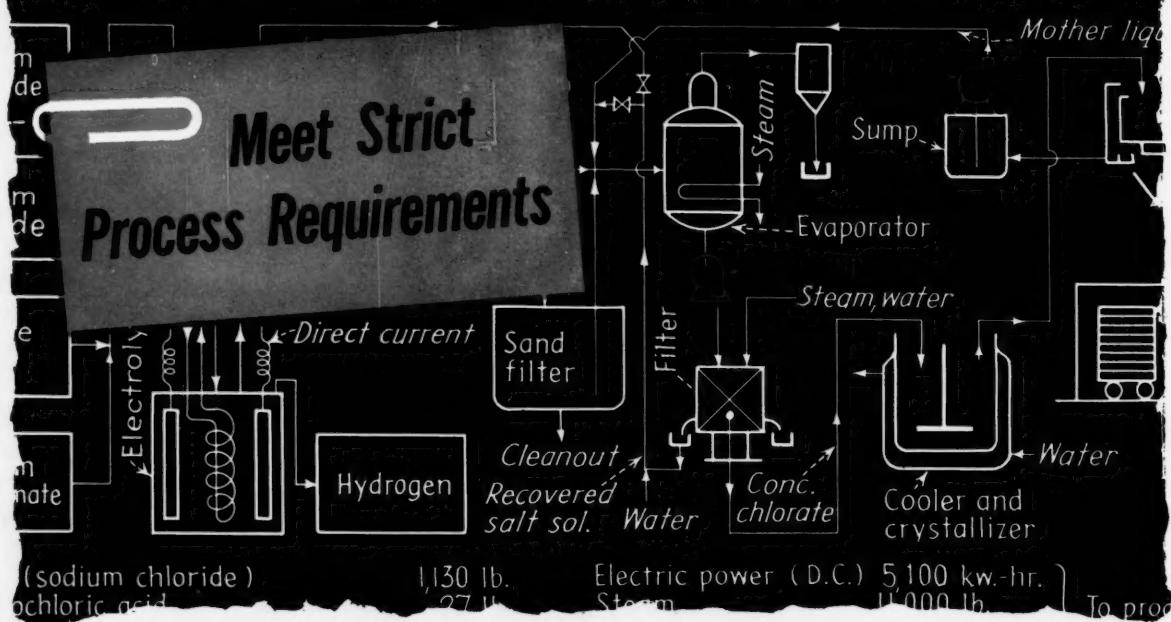
Chemical Week

...guide to the **CHEMSHOW**

see index on page 5A

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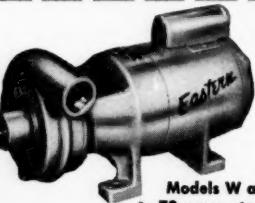
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Models W and Z
to 70 g.p.m., to 11 p.s.i.



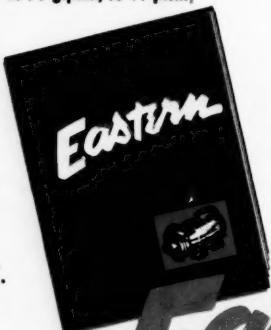
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NEW EASTERN CATALOG
Eastern Centrifugal Pump Catalog contains engineering data, performance charts, diagrams and helpful general information. Request Bulletin 110M.

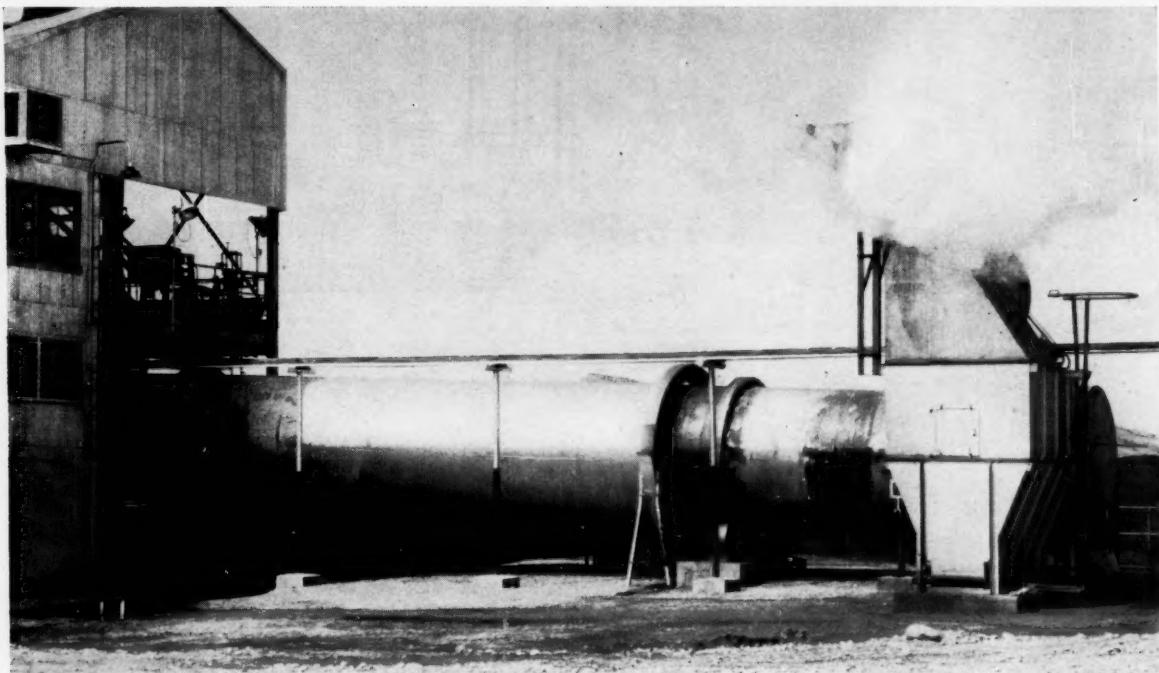
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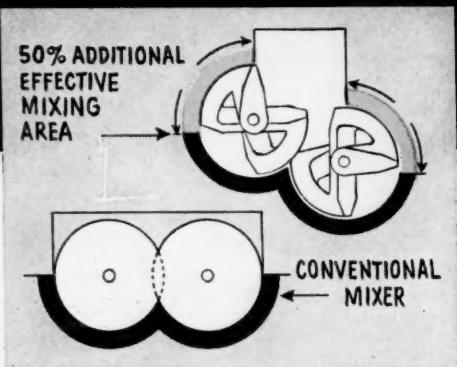
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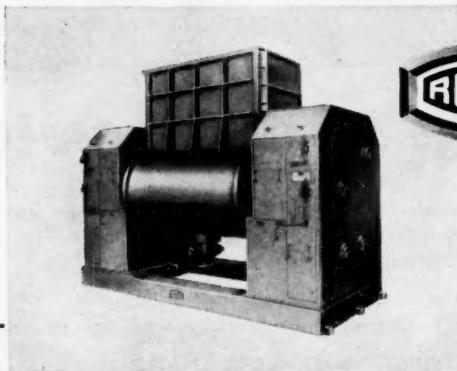
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CW previews

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Dec. 2-6

**Alphabetical directory
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**What to look for at the
Chemshow** — a capsule glimpse of a few of the newest products and equipment "firsts" you'll see at the exposition 39A

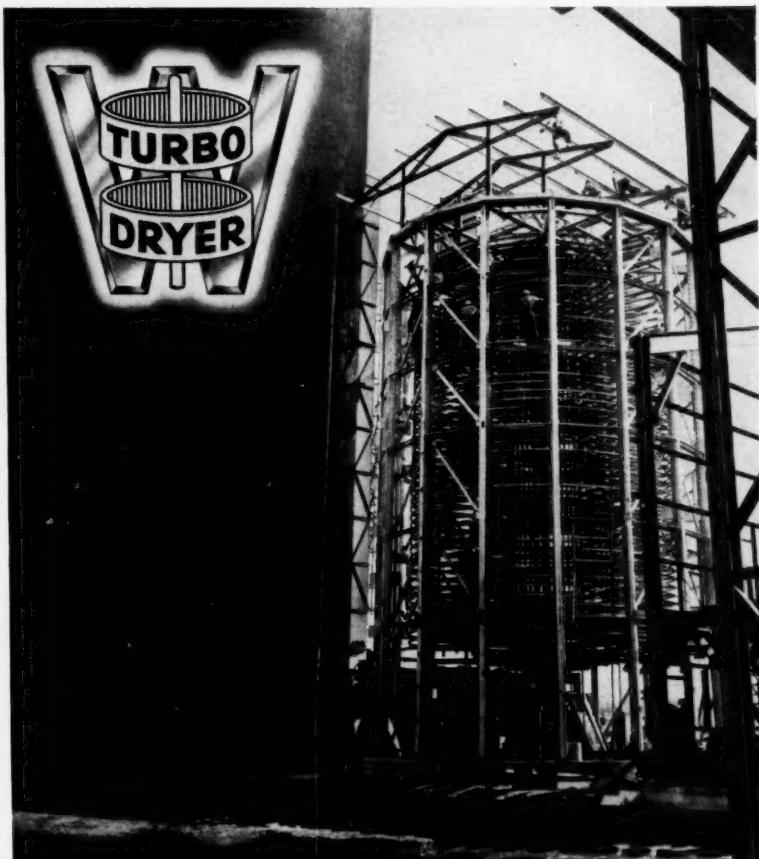
**Chemical Engineering
Awards**—a list of the 78 joint winners of the award and highlights of their outstanding contributions to the commercial development of the "exotic" metals 47A

**Where to go in and
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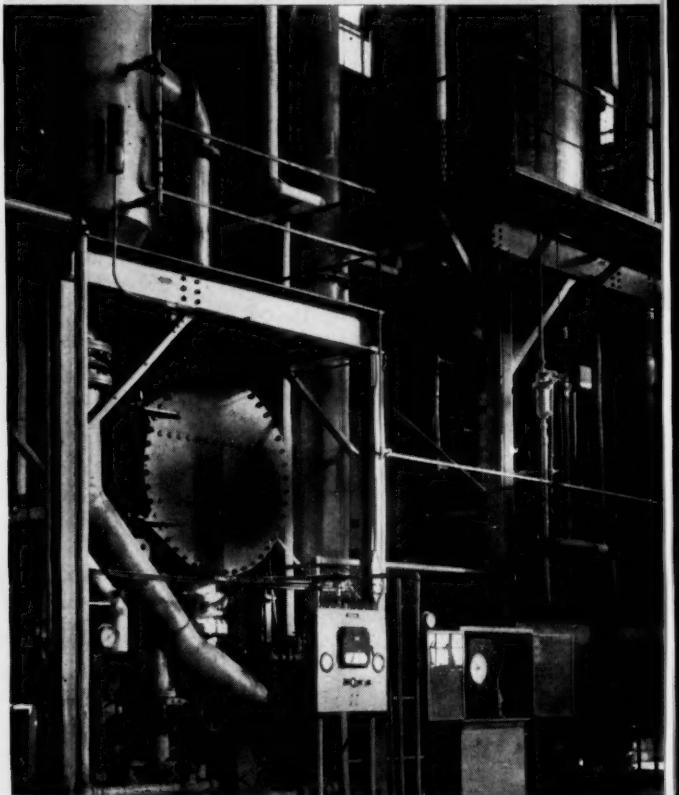


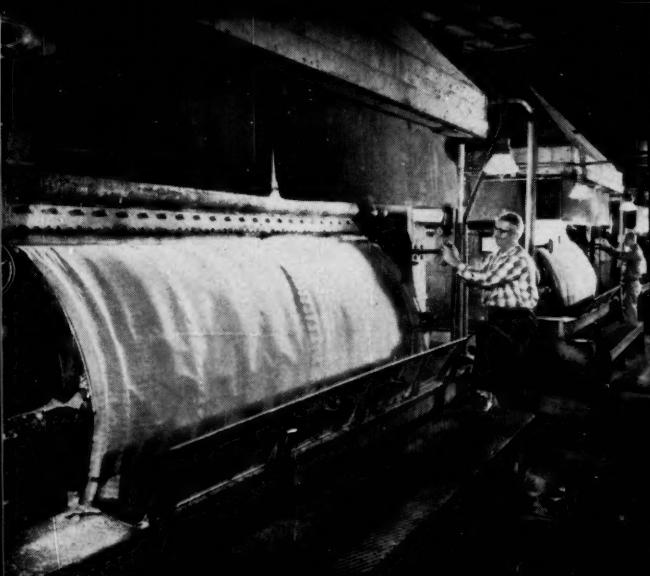
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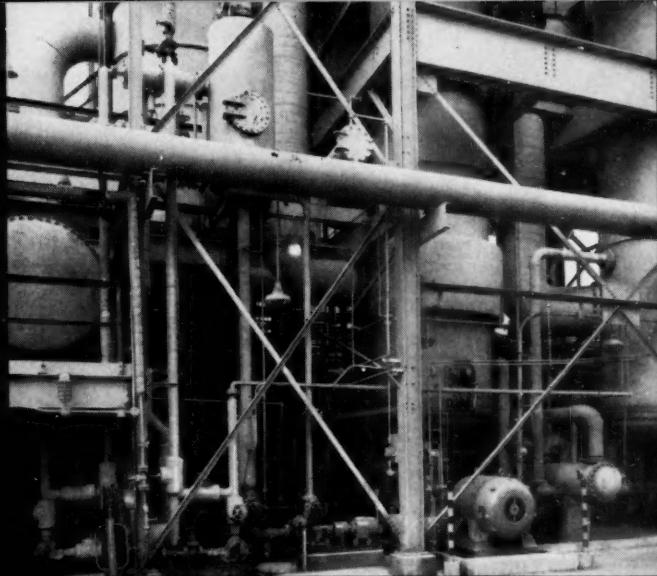
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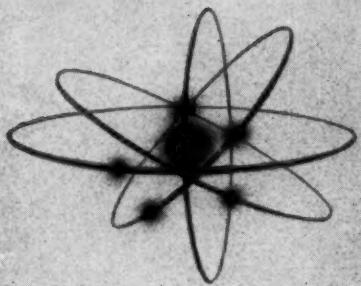
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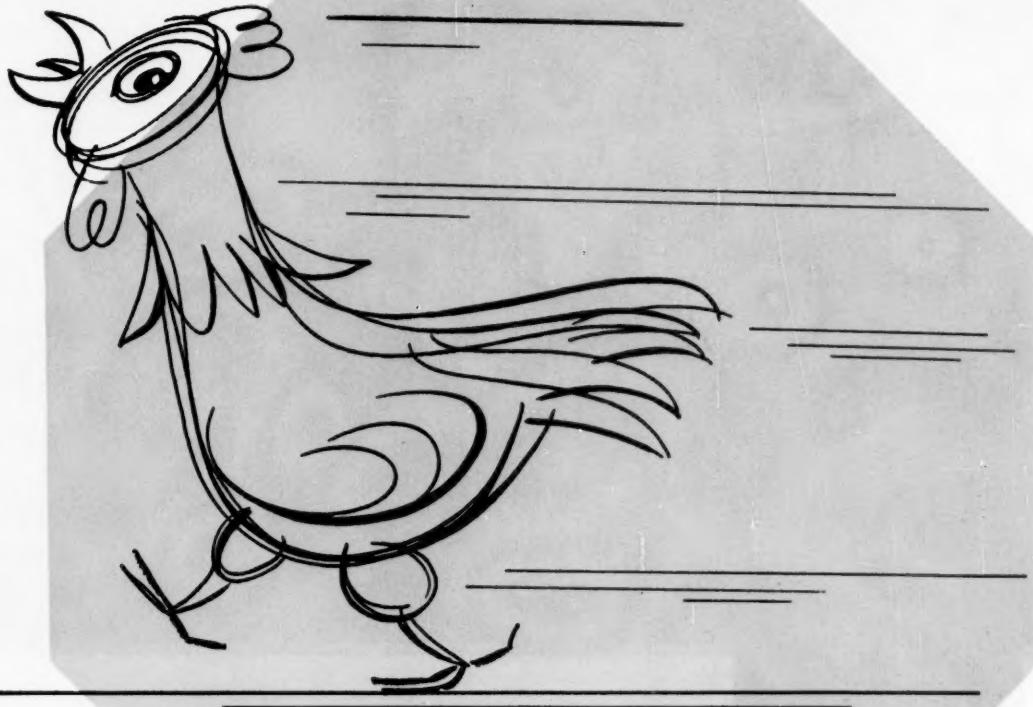
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THRAM is economical, easy to use and instantly effective. It makes chicken feathers so distasteful to other chickens that picking stops overnight.

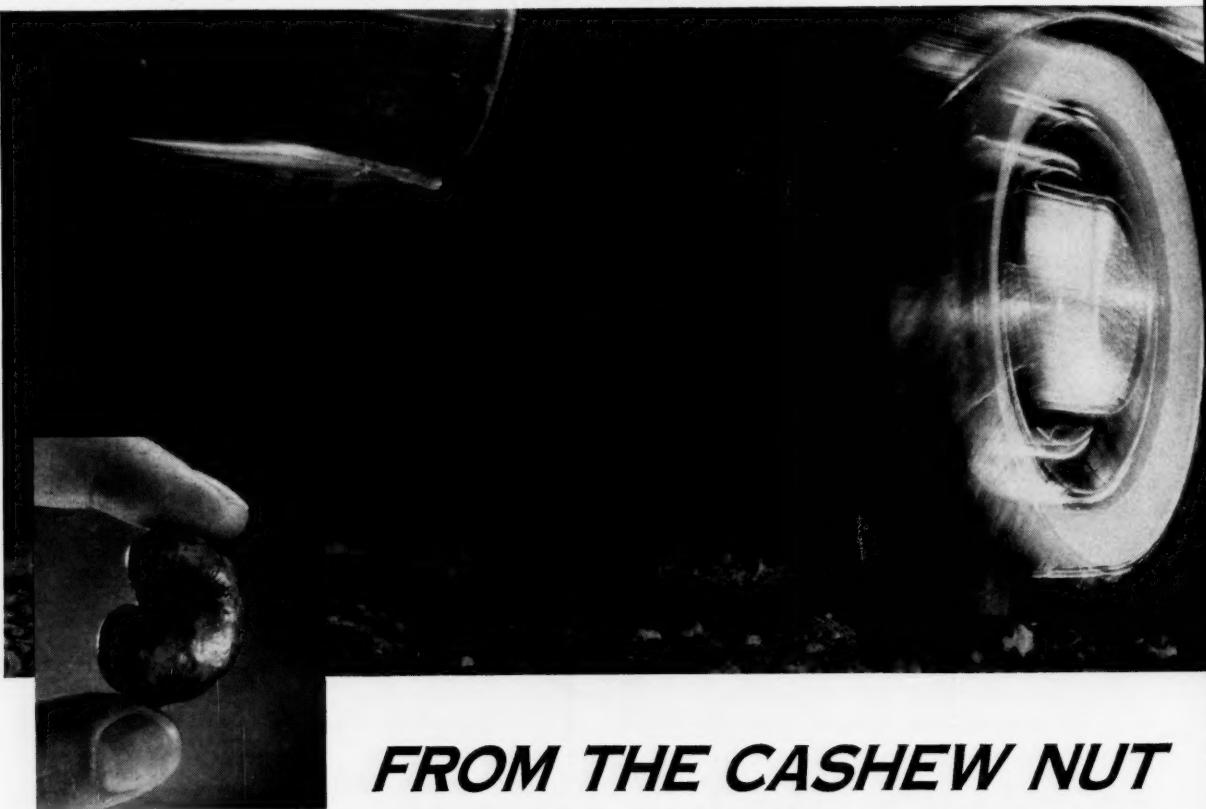
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FROM THE CASHEW NUT

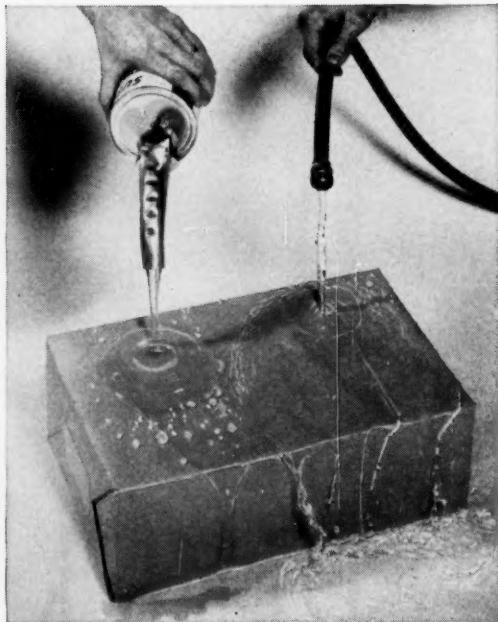
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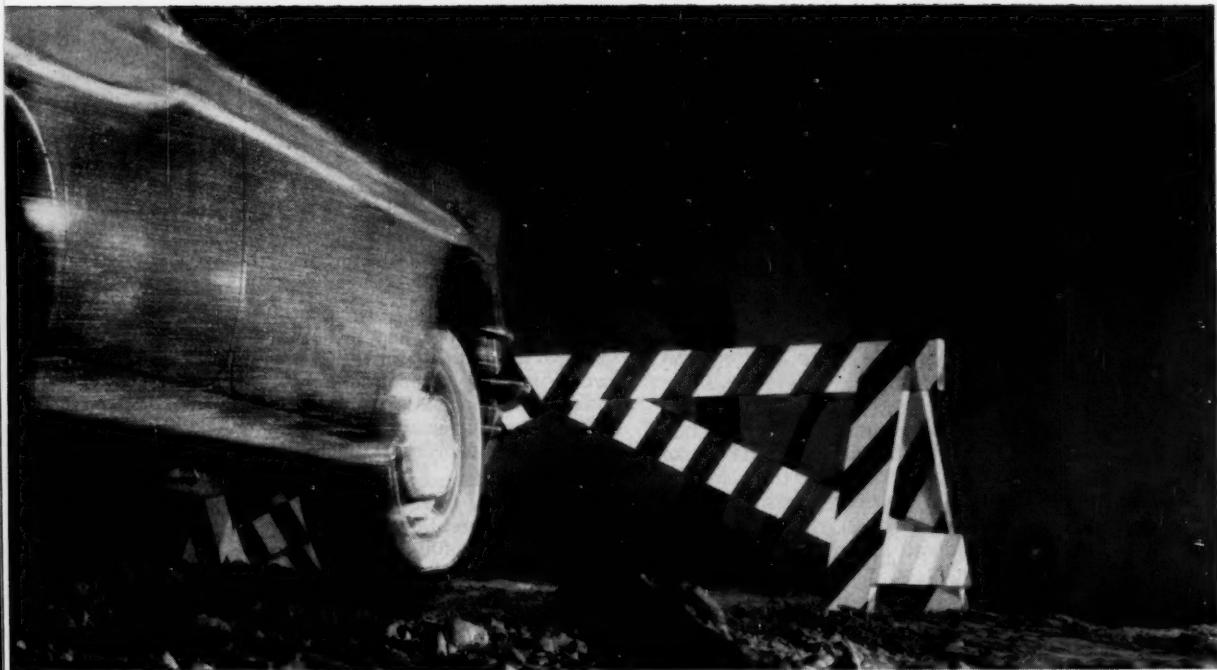
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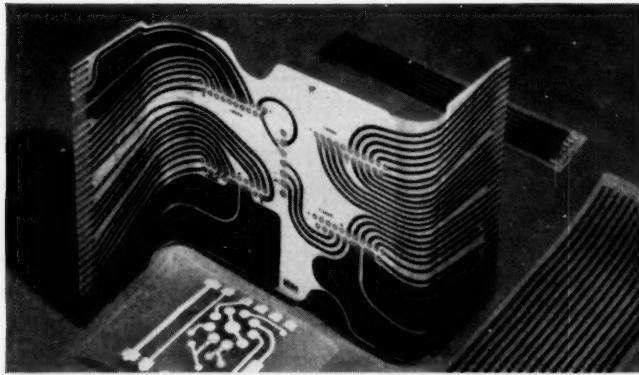
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**One pound of
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absorbs as much
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Micro-Cel is a product of the Celite Division



VOGT identification Disc...

...on top
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makes it easy
to identify valves
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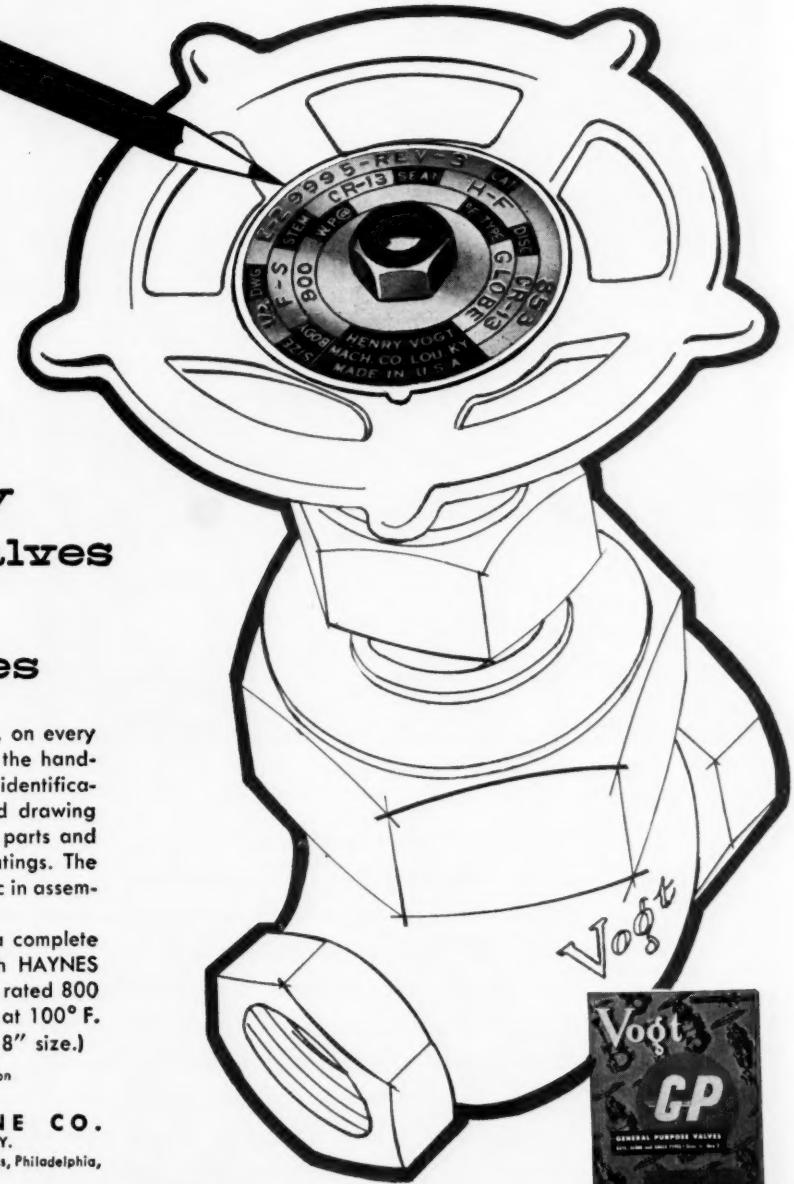
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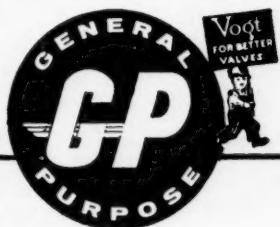
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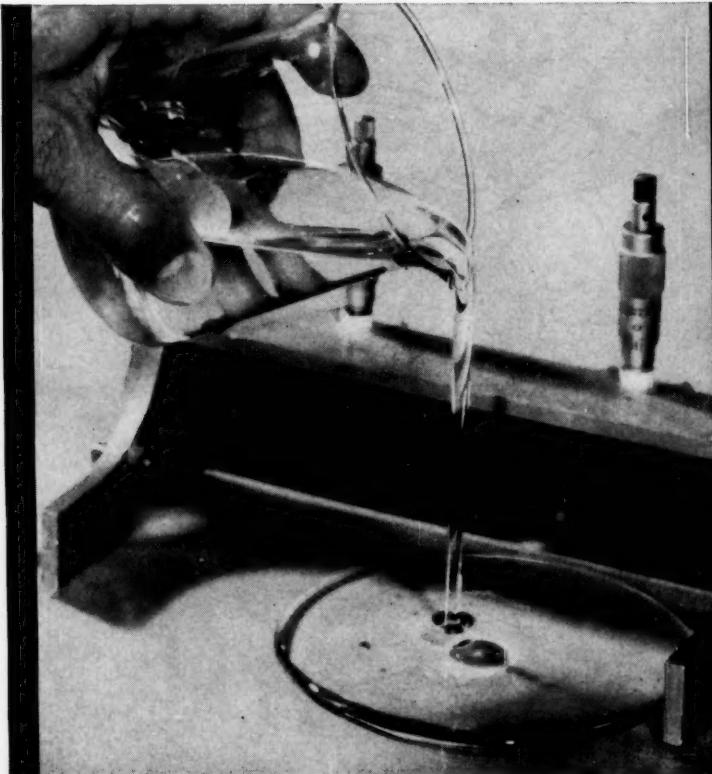
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. . . Cast in a clear film 1 mil thick . . .

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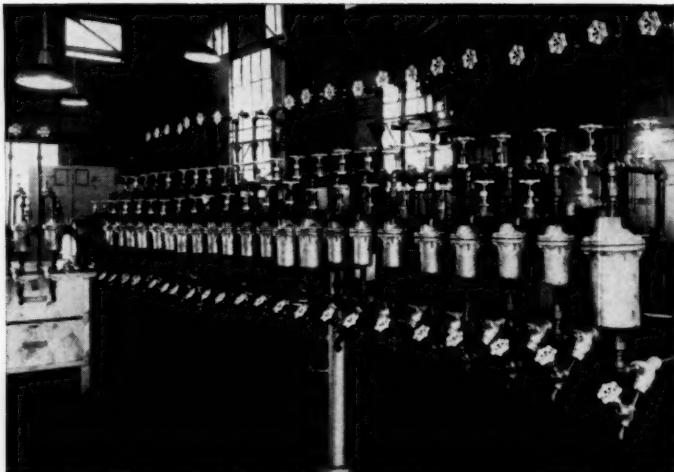
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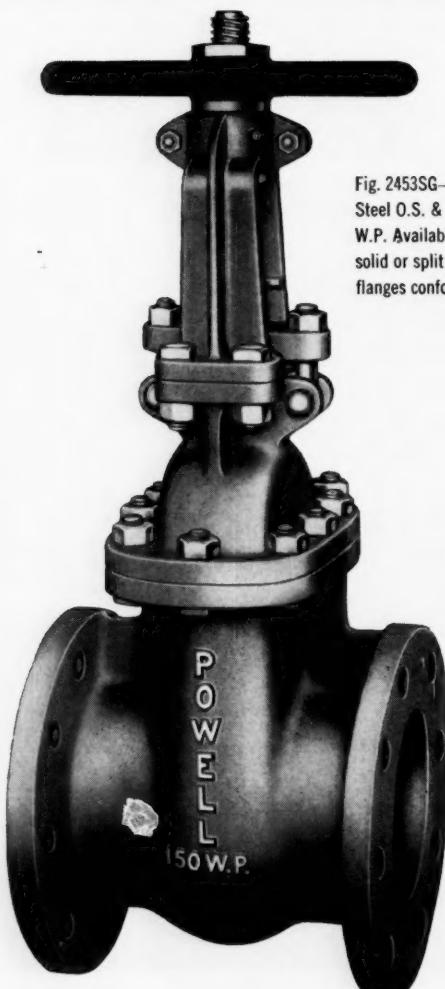


Fig. 2453SG—Large Stainless Steel O.S. & Y. Gate Valve for 150 W.P. Available with interchangeable solid or split wedge disc. End flanges conform to MSS SP-42.

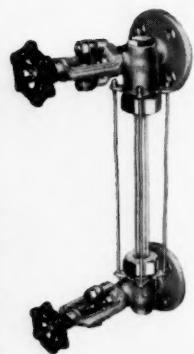


Fig. 2172—Small flush Bottom Tank Valve for 150 W.P. Disc opens into tank. Also available with disc opening into valve (Fig. 2173).



Fig. 2475—Stainless Steel O.S. & Y. Globe Valve for 150 W.P. face to face and end flange dimension are in accordance with latest standards.



Fig. 2475BSW—Stainless Steel Bell-O-Seal Globe Valve for 150 W.P. For handling heavy water, molten metals, etc. Can also be furnished for 300 W.P.

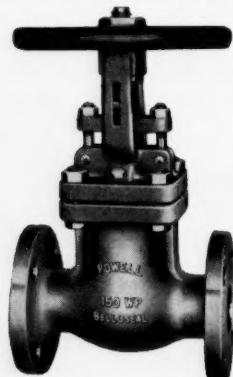
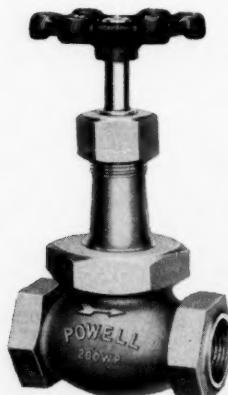


Fig. 1861—Stainless Steel Globe Valve for 200 W.P. Union bonnet, plug type disc.



*Powell Alloy (Corrosion Resistant) Valves are available with screwed or flanged ends. Flanged end valves conform to latest standards.

LINE of ALLOY VALVES*

... for Corrosive Services



Fig. 2194—Small Ni-Resist. O.S. & Y. Gate Valve for 225 W.O.G. Larger sizes, flanged end, and swing check valves in Ni-Resist also available.



Fig. 1832—Stainless Steel Gate Valve for 200 W.P. Screwed-in bonnet, inside screw rising stem, solid wedge disc.

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at

BOOTH 133

26th Exposition of
Chemical Industries

December 2 to 6

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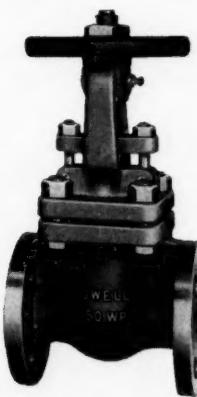


Fig. 2491—Stainless Steel Gate Valve for 150 W.P. Outside screw rising stem and yoke, solid wedge disc. Can be supplied with interchangeable split wedge disc

It's a fact . . . Powell offers more kinds or types of valves, available in the largest variety of corrosion-resistant metals and alloys, to handle practically every known corrosive fluid. The complete line includes gates, globes, angles, checks, "Y's", relief, flush bottom tank valves and others—for pressures from 150 to 1500 WP. A few are shown on these two pages.

Your local valve distributor will be glad to tell you all about them. If none is near you, write to us for the full facts on Powell Valves and Powell Engineering Service.

THE WM. POWELL COMPANY

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CINCINNATI 22, OHIO



Fig. 1559—Steel Lubricated Plug Valve for 200 W.O.G. Screwed gland type. 6" and larger valves can be furnished for gear operation.



Fig. 1893—Large O.S. & Y. Gate Valve for Paper Mill Service. 3% Nickel Iron Body, bonnet, yoke; stainless steel stem, screwed-in seat rings; Ni-Resist wedge.



Fig. 2433SS—Large size
Stainless Steel Swing Check
Valve for 150 W.P. Bolted Cap.

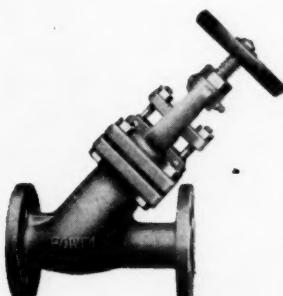


Fig. 2107—Stainless Steel "Y" Valve for
150 W.P. Plug type disc. Face to face and end
flange dimensions conform to latest standards.



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595

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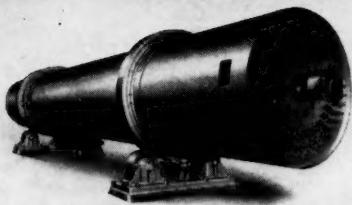
You know that there are very few problems that are *child's play* today . . . especially if chemicals are involved. And that's where Victor may have the edge . . . if you are considering the advantages of phosphates, formates, or oxalates, we've been producing some of these favorites for over 60 years. So, when you are ready to *play for keeps*, tell us which Victor chemical you need, and we'll have a sample on the way before you can say, "It pays to see Victor". Write to: Victor Chemical Works, Box 271, Chicago 90.

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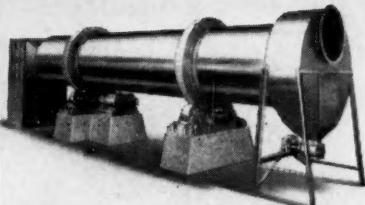
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made to your SPECIFICATIONS

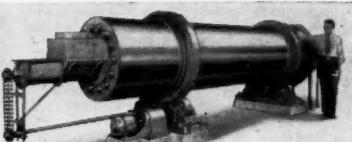
BOOTH 818 — NEW YORK SHOW



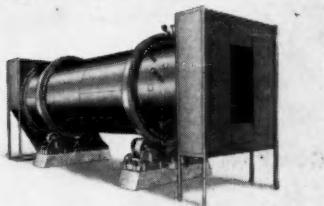
"Davenport" Rotary Steam Tube Dryer for drying soybean flakes.



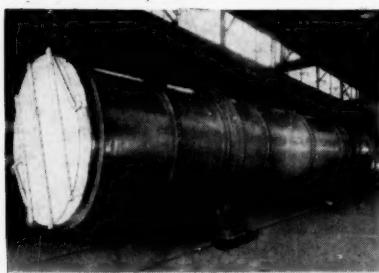
"Davenport" Rotary Hot Air Dryer drying whey powder, a by product from the manufacture of cheese.



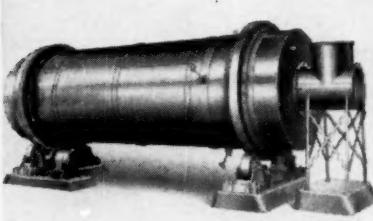
"Davenport" 3' - 6" Dia. Rotary Water Tube Cooler.



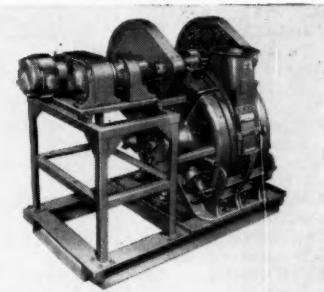
"Davenport" Rotary Hot Air Dryer for drying wheat gluten.



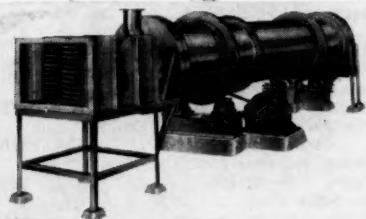
"Davenport" Rotary Hot Air Dryer fabricated from stainless steel for drying Adipic Acid.



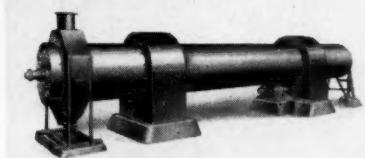
"Davenport" Rotary Cooler fabricated from aluminum, for cooling molten alum.



"Davenport" Continuous De-Watering Press made in three sizes for various capacities.



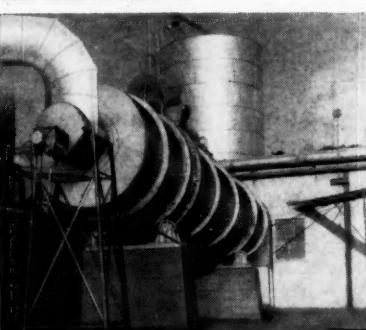
"Davenport" Rotary Hot Air Dryer for drying heat sensitive materials.



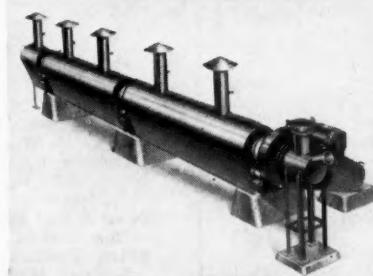
"Davenport" Rotary Steam Tube Dryer, drying sodium and potassium perchlorates.



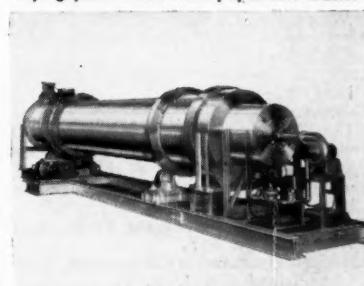
"Davenport" Double Drum Atmospheric Dryers drying yeast made from paper mill waste.



"Davenport" Rotary Air Cooler cooling soybean meal from a solvent extraction process.



Special "Davenport" Rotary Indirect Fired Dryer fabricated of special stainless steel using natural gas as heating medium.



"Davenport" Rotary Direct Fired Dryer for drying and calcining welding flux.

If you have a De-Watering — Drying or Cooling problem, our experienced engineers with our pilot plant can assist you with your problems. For quick reference, see Chemical Engineering 1957 catalog, or write for our Catalog B.

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Alphabetical List of Exhibitors

26th Exposition of Chemical Industries

Coliseum, New York, N. Y., Dec. 2-6, 1957

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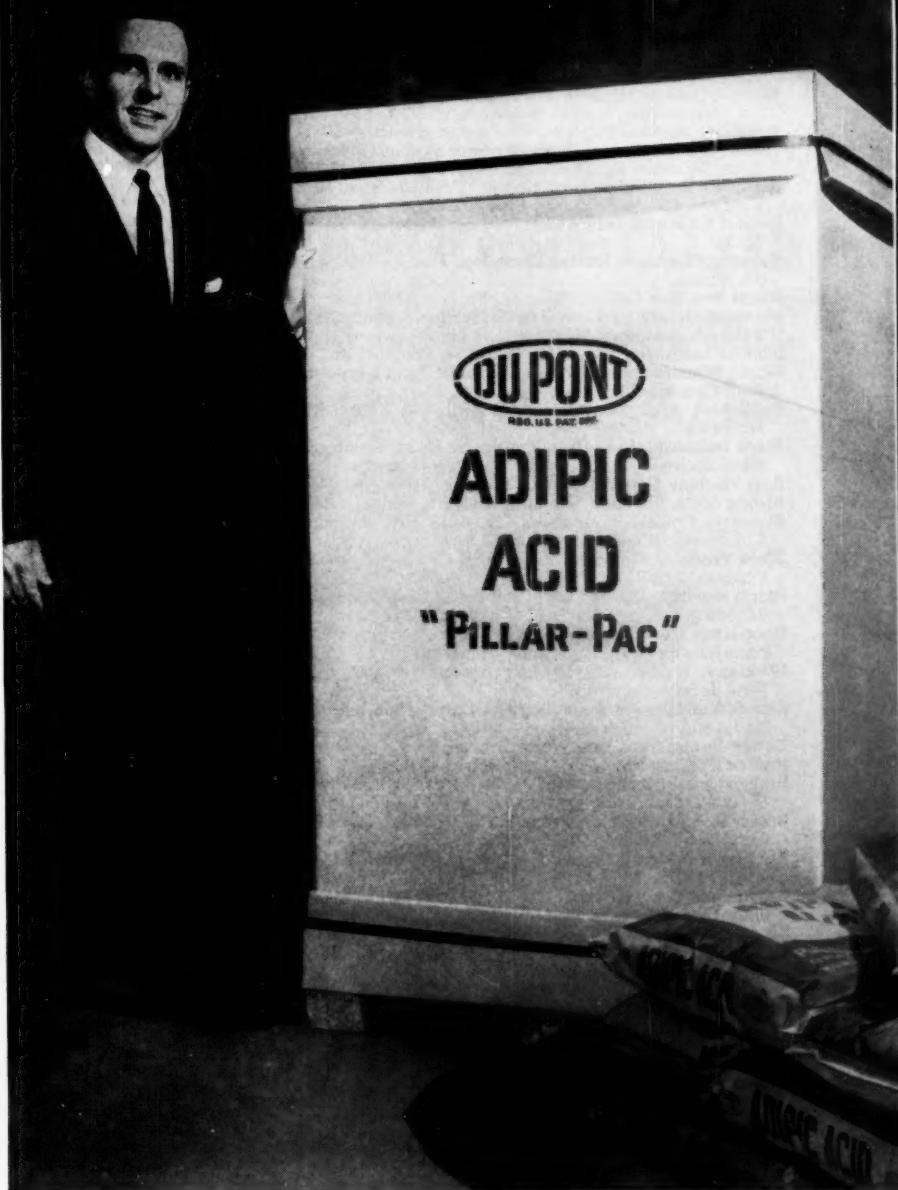
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JOE COLLIE is Sales Representative for the Du Pont Polychemicals Department in the Charlotte, North Carolina, area. Joe, a native of Danville, Virginia, received his Bachelor of Science

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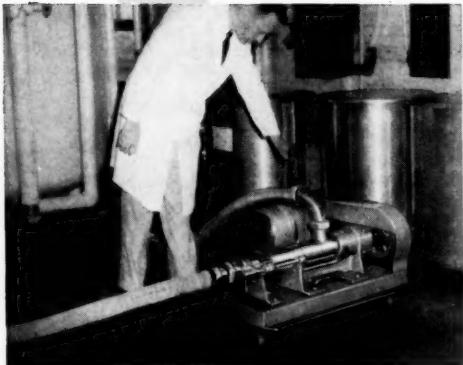
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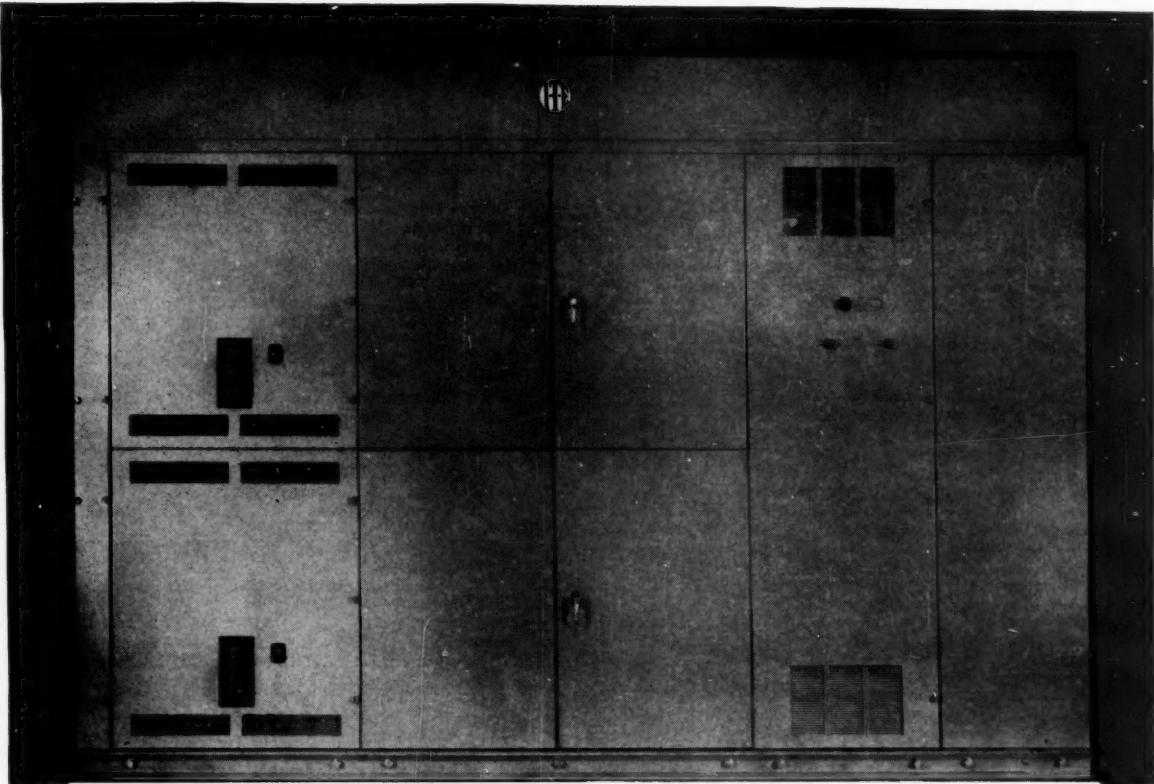
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Fisher Scientific Company , 711 Forbes St., Pittsburgh 19, Pa.	386
Fitzpatrick Company, The W. J. , 1001 W. Washington Blvd., Chicago 7, Ill.	49
Fitzpatrick Corp., The	1095
Fletcher Works, Inc. , Glenwood Ave & Second St., Philadelphia 40, Pa.	459
Flow Actuated Control Co. , Englewood, N. J.	1343
Fluid Energy Processing & Equipment Co. , Richmond & Norris Sts., Philadelphia 25, Pa.	997
Fluor Products Company , Whittier, Calif.	1036
Food Machinery and Chemical Corporation, Becco Chemical Division , Station B, Buffalo 7, N. Y.	1434
Peerless Pump Division , 301 West Ave. Twenty Six, Los Angeles 31, Calif.	831
Westvaco Chlor-Alkali Division , 161 East 42nd St., New York 17, N. Y.	1436
Food Processing , 111 E. Delaware Place, Chicago 11, Ill.	880
Foote Bros. Gear & Machine Corporation , 4545 So. Western Blvd., Chicago 9, Ill.	14



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Foxboro Company, The, Foxboro, Mass.	519	Harman Associates, F. Ward, Halesite, Long Island, N. Y.	994		
Freezing Equipment Sales, Inc., 1405 N. Duke St., York, Pa.	446	Harper Company, The H. M., Morton Grove, Ill. 1032, Hart-Moisture-Meters, 336 West Islip Boulevard, Babylon, L. I., N. Y.	1034		
Frick Company, Waynesboro, Pa.	1258, 1260	Havex Industries, Inc., 900 Greenbank Road, Wilmington 8, Del.	369		
Fuller Company, The, Catasauqua, Pa.	446	Haynes Stellite Company, Division of Union Carbide Corporation, 30 East 42 St., New York 17, N. Y.	546		
G					
Galigher Company, The, 545-585 West 8th South St., P.O. Box 209, Salt Lake City 10, Utah	1054	Healy-Russ Co., St. Paul, Minnesota	1343		
Garlock Packing Company, The, Palmyra, N. Y.	415	Heil Process Equipment Corporation, 12901 Elmwood Ave., Cleveland 11, Ohio	1305		
Gaylord Container Corporation Division of Crown Zellerbach Corporation, 111 No. 4th St., St. Louis 2, Missouri	1121, 1123	Heinlein Instruments Co., 2035 Harding St., Hollywood, Florida	1074		
Geigy Industrial Chemicals Division of Geigy Chemical Corporation, Saw Mill River Road, Ardsley, N. Y.	916	Hercules Filter Corporation, 175 Ethel Ave., Hawthorne, N. J.	213		
Gems Co., Newington, Conn.	1343	Hetherington and Berner, Inc., 701-745 Kentucky Ave., Indianapolis 3, Indiana	813		
General Alloys Company, 405 West First St., Boston 27, Mass.	193	High Pressure Equipment Co., Inc., 1222 Linden Ave., Erie, Pa.	1272		
General American Transportation Corporation, 135 So. LaSalle St., Chicago 90, Illinois	436	Hills-McCanna Company, 3025 N. Western Ave., Chicago 18, Ill.	1173, 1175		
General Ceramics Corporation, Keasbey, N. J.	131	Hockmeyer & Company, Herman, 341 Coster St., Bronx 59, N. Y.	1178		
General Dispersions Inc., 165 Third Ave. at E. 26th St., Paterson, N. J.	967	Hoke Incorporated, 136 So. Dean St., Englewood, N. J.	201		
General Dynamics Corporation, Electro Dynamic Division, Bayonne, N. J.	1152	Hope Electrical Products Company, Inc., 38 Long Ave., Hillside, N. J.	1351		
General Electric Company, Apparatus Sales Division, 1 River Road, Schenectady 5, New York	482	Horman & Co., Inc., F. R., 17 Stone St., Newark 4, N. J.	977		
General Electric Company, Missile and Ordnance Systems Dept., 3198 Chestnut St., Philadelphia 4, Pa.	1431	Hough Co., The Frank G., Libertyville, Ill.	63		
General Electric Co., Specialty Heating Products, Cosackie, N. Y.	1413	Howe Scale Company, The, Rutland, Vermont	645		
General Laboratory Supply Company, P.O. Box 2607, Paterson, N. J.	310	Hungerford & Terry, Inc., Clayton, N. J.	1200		
General Plastics Corporation, 165 Third Ave. at East 26th St., Paterson, N. J.	967	Hunt Machine Co., Rodney, Mill Street, Orange, Mass.	1240, 1242, 1244		
General Plate Div. Metals & Controls Corp., Attleboro, Mass.	1094	Hydrex Division, The New York Air Brake Company, 1100 East 22nd St., Cleveland 17, Ohio	884, 886		
Gifford-Wood Co., Hudson, N. Y.	219	I			
Girdler Company, The, Catalyst Department, A Division of National Cylinder Gas Co., 224 E. Broadway, Louisville 1, Ky.	94	I-T-E Circuit Breaker Company, 19th & Hamilton Sts., Philadelphia 30, Pa.	25		
Girdler Company, The, Votator Division, A Division of National Cylinder Gas Co., 224 E. Broadway Louisville 1, Ky.	94	Illinois Water Treatment Co., Rockford, Ill.	888		
Glengarry, Inc., Bay Shore, N. Y.	60	Imperial Brass Manufacturing Co., The, 6300 W. Howard St., Chicago 31, Ill.	894, 896		
Globe Company, The, Products Division, 4000 S. Princeton Ave., Chicago 9, Ill.	890	Industrial Division Minneapolis-Honeywell Regulator Company, Wayne & Windrim Avenues, Philadelphia 44, Pa.	635		
Goulds Pumps, Inc., Seneca Falls, N. Y.	1204	Industrial and Engineering Chemistry, 430 Park Ave., New York 22, N. Y.	86		
Gow-Mac Instrument Company, 100 Kings Road, Madison, N. J.	1246	Industrial and Engineering Chemistry, 1155 16th St. NW, Washington 6, D. C.	410		
Great Lakes Carbon Corporation, 18 East 48th St., New York 17, N. Y.	204	Industrial Filter & Pump Mfg. Co., 5900 Ogden Ave., P.O. Box 151, Chicago 50, Ill.	1273		
Great Western Manufacturing Co., Leavenworth, Kansas	216	1188, 1190, 1192, 1194, 1196, 1202, 1237, 1238, 1271, 1273			
Greif Bros. Cooperage Corporation, The, 175 E. Hoffman Ave. P.O. Box 398, Lindenhurst, L. I., N. Y.	41	Industrial Plastic Fabricators, Inc., Endicott St., Norwood, Mass.	1217		
Grinnell Company, Inc., Providence 1, R. I.	566	Industrial Products Engineering Company, 26-40 Jackson Ave., Long Island City 1, New York	1215		
Gump Co., B. F., 1325 S. Cicero Ave., Chicago 50, Ill.	1024, 1026	Infilco Inc., P.O. Box 5033, Tucson, Arizona	1163		
H		Ingersoll-Rand Company, 11 Broadway, New York 4, N. Y.	128		
Hamer Valves, Inc., 2919 Gardenia Ave., Long Beach 6, Calif.	1268, 1270	International Engineering, Inc., Dayton 1, Ohio	812		
Hamilton Kettles Div., Brighton Corp., Cincinnati, Ohio	1341	International Nickel Company, Inc., The, 67 Wall Street, New York 5, N. Y.	509		
Hamilton Manufacturing Company, Two Rivers, Wisconsin	359	Interscience Publishers, Inc., 250 Fifth Ave., New York 1, N. Y.	1069		
Hanovia Chemical & Manufacturing Company, 100 Chestnut St., Newark 5, N. J.	190, 192, 196	J			
Hapman Conveyors, Inc. Division Hapman-Dutton Company, 630 Gibson St., Kalamazoo 6, Michigan	1345	Jabsco Pump Company, 2031 N. Lincoln St., Burbank, Calif.	1016		
Harbison-Walker Refractories Company, 1800 Farmers Bank Bldg., Pittsburgh 22, Pa.	1241, 1243	Jacoby-Tarbox Corporation, 808 Nepperhan Ave., Yonkers, N. Y.	1362		
Hardinge Company, Inc., 240 Arch St., York, Pa.	582	Jamesbury Corporation, 45 New St., Worcester 5, Mass.	1038		
Hardinge Manufacturing Company, 240 Arch St., York, Pa.	582	Jarco Services, Inc., Tulsa, Oklahoma	1343		
Haring Equipment Corp., 293 Frelinghuysen Ave., New-	582	Jeffrey Manufacturing Co., The Columbus 16, Ohio	97		

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Journal of Agricultural and Food Chemistry , 115 16th St. NW, Washington 6, D. C.	410	Mannesmann-Easton Plastic Products Co., Inc. , 900 Line St., P. O. Box 541, Easton, Pa.	1115
Journal of Chemical Education , 500 Fifth Ave., New York 36, N. Y.	1087	Manton-Gaulin Manufacturing Company, Inc. , 44 Garden St., Everett 49, Mass.	51
		Marlo Coil Company , 6135 Manchester Ave., St. Louis 10, Mo.	1053, 1066
K		Marman Div. Aeroquip Corporation , 11214 Exposition Blvd., West Los Angeles 64, Calif.	1419
Kaiser Aluminum & Chemical Sales, Inc. , Kaiser Bldg., 1924 Broadway, Oakland 12, California	1128, 1130	Marsh Stencil Machine Company , Belleville, Ill.	1251
Kanigen Division General American Transportation Corporation , 135 S. LaSalle St. Chicago 90, Ill.	436, 442	Martin Company, The , Baltimore 3, Md.	1420, 1422
Kaup & Co., C. B. , 32 Newark Way, Maplewood, N. J.	1425, 1427	Martin Engineering Company , Neponset, Ill.	1118
Kennametal Inc. , Latrobe, Pa.	1116, 1137, 1139, 1141, 1143	Master Electric Company, The , Div. of Reliance Electric Engineering Co., Dayton 1, Ohio	10
Keweenaw Mfg. Company , Adrian, Michigan	398	Materials and Methods , 430 Park Ave., New York 22, N. Y.	86
Kimble Glass Company Subsidiary of Owens-Illinois , Toledo 1, Ohio	390	Metal Glass Products Company , Belding, Michigan	623
Kinney Manufacturing Company , Subsidiary of The New York Air Brake Company, 3529-3541 Washington St., Boston 30, Mass.	884, 886	Metal Hydrides Incorporated , Beverly, Mass.	944
Klein Filter & Manufacturing Co. , 26-40 Jackson Ave., Long Island City 1, N. Y.	1215	Metal Textile Corporation , 647 East First Ave., Roselle, N. J.	1020
Klinger Inc., Richard , 550 Fourth Ave., Brooklyn 15, N. Y.	1347	Metalab Equipment Company Division of Norbut Corporation , 270 Duffy Ave., Hicksville, L. I., N. Y.	356
Knapp Mills, Incorporated , 23-15 Borden Ave., Long Island City 1, N. Y.	175	Metals & Controls Corporation, General Plate Division , Attleboro, Mass.	1094
Knight, Maurice A. , Kelly Avenue, Akron 9, Ohio	586	Mettler Instrument Corporation , Box 242, Hightstown, N. J.	339
Komline-Sanderson Engineering Corporation , Peapack, N. J.	1100	Michigan Chemical Corporation , St. Louis, Michigan	942
Koven & Brother, Inc. , L. O., 90 E. Dickerson St., Dover, N. J.	74	Michigan Wheel Company , 235 Market Ave., SW, Grand Rapids 3, Michigan	1091
Koven Fabricators, Inc. , 90 East Dickerson St., Dover, N. J.	74	Micro Metallic Corporation , 30 Sea Cliff Ave., Glenco, N. Y.	1012, 1014
		Miller & Son, Inc. Franklin P. Supreme Crusher Division , 38 Meadow St., E. Orange, N. J.	1010
L		Milton Roy Company , 1300 E. Mermaid Lane, Philadelphia 18, Pa.	610
Laboratory Equipment Corporation , P.O. Box 151, St. Joseph, Michigan	905	Mine Safety Appliances Company , 201 N. Braddock Ave., Pittsburgh 8, Pa.	81
Laboratory Furniture Co., Inc. , Old Country Road, P.O. Box 590, Mineola, N. Y.	309	Minneapolis-Honeywell Regulator Company, Industrial Division , Wayne & Windrim Avenues, Philadelphia 44, Pa.	635
Laboratory Glass & Instrument Company , 514 West 147 St., New York 31, N. Y.	340	Minnesota Mining and Manufacturing Company , 900 Fauquier Ave., St. Paul 6, Minnesota	931
Labour Company, Inc. , The, Elkhart, Indiana	42	Mirenda Corporation , 253 Battle Ave., White Plains, N. Y.	1159
Ladish Co. , Cudahy, Wisconsin	1288, 1290	Misco Fabricators , 2420 Wills Ave., P. O. Box 125, Marysville, Mich.	1037
Ladish Co. , Tri-Clover Division, Kenosha, Wisconsin	1292, 1294	Mission Manufacturing Company , P. O. Box 4209, Houston 14, Texas	817
Lancaster Chemical Co. , 13th & Broad Sts., Carlstadt, N. J.	922	Missouri Coke & Chemical Division Great Lakes Carbon Corporation , 8251 Maryland Ave., St. Louis 24, Mo.	204
Lapp Insulator Co., Inc. , Process Equipment Division, LeRoy, N. Y.	696	Missouri Division of Resources and Development , Jefferson Bldg., Jefferson City, Mo.	834
Lawrence Pumps, Inc. , 371 Market St., Lawrence, Mass.	852	Mixing Equipment Co., Inc. , 135 Mt. Read Blvd., Rochester 11, N. Y.	146
Lead Industries Ass'n , 60 East 42nd Street, New York 17, N. Y.	816	Monarch Manufacturing Works, Inc. , 2501 E. Ontario St., Philadelphia 34, Pa.	881
Lead Lined Iron Pipe Company , Wakefield, Mass.	70	Montecatini Soc. Gen. , Milan, Italy. American Rep.: Chemore Corp., 21 West St., New York 6, N. Y.	961
Lebanon Steel Foundry , Lebanon, Pa.	20	930, 932, 934,	
Lehmann Company, Inc. , J. M. 550 New York Ave., Lyndhurst, N. J.	1205	Morehouse-Cowles, Inc. , 1156 San Fernando Road, Los Angeles 65, Calif.	814
Lennard Co., Inc. , P. M., 1 Hanson Place, Brooklyn 17, N. Y.	1227	Multi Metal Wire Cloth Co., Inc. , 1350 Garrison Ave., New York 59, N. Y.	191
Leslie Co. , Lyndhurst, N. J.	1333	Mundet Cork Corporation , 7101 Tonelle Ave., North Bergen, N. J.	16
Linde Company , A Division of Union Carbide Corporation, 30 East 42nd St., New York 17, N. Y.	460		
Link-Belt Company , Prudential Plaza, Chicago 1, Ill.	165		
Logan Emergency Showers, Inc. , P.O. Box 111, Glendale, Calif.	883		
Louisville Drying Machinery Company Unit General American Transportation Corporation, 139 So. 4th Street, Louisville, Ky.	436, 442		
Lukens Steel Company , Coatesville, Pa.	876		
Luverne Rubber Company, The , Trenton 7, N. J.	435		
M			
McGraw-Hill Book Company, Inc. , 330 W. 42nd Street, New York 36, N. Y.	974	Nalge Co., Inc. , The, 625 S. Goodman St., P. O. Box 365, Rochester 2, N. Y.	1106
McGraw-Hill Publishing Company , 330 West 42nd Street, New York 36, N. Y.	481	Namco Machinery Inc. , 54 Kosciusko St., Brooklyn 5, N. Y.	1172
McIntosh Equipment Corp. , 15 Park Row, New York 38, N. Y.	1341, 1343	Nash Engineering Company , The, South Norwalk, Conn.	238
Magnetrol, Inc. , 2110 S. Marshall Blvd., Chicago 23, Ill.	910, 912	National Carbon Company, A Division of Union Carbide Corporation , 30 East 42nd Street, New York 17, N. Y.	460
		National Dust Collector Corporation , 549 W. Washington Blvd., Chicago 6, Ill.	675
		National Engineering Company, Simpson Mix-Muller Division , 549 West Washington Blvd., Chicago 6, Ill.	675
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National Rosin Oil Products, Inc., Savannah, Georgia	917
National Tube Division United States Steel Corporation, 525 William Penn Place, Pittsburgh 30, Pa.	495
Nerofil Department Great Lakes Carbon Corporation, 333 N. Michigan Ave., Chicago 1, Ill.	204
Newark Wire Cloth Company, 351 Verona Ave., Newark 4, N. J.	183
New Brunswick Scientific Company, P.O. Box 606, New Brunswick, N. J.	324
New England Tank & Tower Company, Everett, Mass.	79
New York Air Brake Company, The, 230 Park Ave., New York 17, N. Y.	884
New York Laboratory Supply Co., Inc., 76 Varick St., New York 13, N. Y.	886
Niagara Blower Company, 405 Lexington Ave., New York 17, N. Y.	1022
Niagara Filters Division American Machine and Metals, Inc., E. Moline, Ill.	655
Nichols Engineering Company, The, 3816 West Grand Ave., Chicago 51, Ill.	556
Nichols Engineering & Research Corporation, Nercos-Niro Spray Dryer Division, 70 Pine St., New York 5, N. Y.	1051
Niles Steel Products Division Republic Steel Corporation, Niles, Ohio	624
Norcross Corporation, 247 Newtonville Ave., Newton 58, Mass.	68
Norcross Cos., Sterling E., Kem-Feed Div., 19 Osborne St., Bloomfield, N. J.	443
Nordstrom Valve Division Rockwell Manufacturing Company, 400 N. Lexington Avenue, Pittsburgh 8, Pa.	1372
North American Aviation, Inc., Rocketdyne Division, International Airport, Los Angeles 45, Calif.	843
North Co., The H. W., 305 Comet Bldg., Birmingham 1, Ala.	1449
Norton Company, 1 New Bond St., Worcester 6, Mass.	1216
Nukem Products Corporation, Buffalo 20, N. Y.	1291
	1072

O

Oil & Gas Division Great Lakes Carbon Corporation, 18 East 48th Street, New York 17, N. Y.	204
Okadec Company, The, 332 So. Michigan Ave., Chicago 4, Ill.	1386
Omega Machine Company, 345 Harris Avenue, Providence 1, R. I.	660
Orangeburg Manufacturing Co., Inc., 488 Madison Ave., New York 22, N. Y.	1388
Overstrom & Sons, 2213 West Mission Road, Alhambra, Calif.	996
Owens-Corning Fiberglas Corporation, Toledo 1, Ohio	1266

P

Pacific Valves, Inc., 3201 Walnut Ave., Long Beach 7, Calif.	1315, 1317
Packed Column Corporation, 30 Church Street, New York 7, N. Y.	1018
Palo Laboratory Supplies, Inc., 81 Reade Street, New York 7, N. Y.	385
Pangborn Corporation, Hagerstown, Md.	681
Paquet & Co., M., 17 Battery Pl., New York 4, N. Y.	1096
Parker Hannifin Corp., The, 17325 Euclid Ave., Cleveland 12, Ohio	431
Parks-Cramer Company, Fitchburg, Mass.	55
Patterson Foundry and Machine Company, The, East Liverpool, Ohio	154
Patterson-Kelley Co. Inc., The, 105 Warren Street, East Stroudsburg, Pa.	215
Peabody Engineering Corporation, 232 Madison Ave., New York 16, N. Y.	979
Peerless Mfg. Co., Walnut Hill Lane at Old Denton Road, P.O. Box 13165, Dallas, Texas	1008
Peerless Pump Division Food Machinery and Chemical Corporation, 301 West Ave., Twenty Six, Los Angeles 31, Calif.	831

COMPANY

BOOTH

Pennsylvania Dept. of Commerce, Harrisburg, Pa.	1029
Pennsylvania Fluorocarbon Company, Inc., 1115 No. 38th St., Philadelphia 4, Pa.	969
Perkin-Elmer Corporation, The, Norwalk, Conn.	1083
Perlite Department Great Lakes Carbon Corporation, 612 S. Flower St., Los Angeles 17, Calif.	204
Petrometer Corporation, 43-22 10th St., Long Island City 1, N. Y.	1384
Pfaudler Co., The, a Div. of Pfaudler-Permutit, Inc., 1000 West Ave., Rochester 3, N. Y.	141
Philadelphia Gear Works, Inc., G St. below Erie Ave., Philadelphia 34, Pa.	164
Philadelphia Pump Div. of American Meter Co., 13500 Philmont Ave., Philadelphia 16, Pa.	150
Phillips Petroleum Co., Rocket Fuels Div., McGregor, Tex.	1451
Photovolt Corporation, 95 Madison Ave., New York 16, N. Y.	389
Pick Manufacturing Co., Water Heater Division, West Bend, Wisconsin	1341
Pioneer-Central Div., Bendix Aviation Corp., Davenport, Iowa	1440
Pioneer Division Scott & Williams, Inc., Laconia, New Hampshire	1146
Pittsburgh Corning Corporation, One Gateway Center, Pittsburgh 22, Pa.	1239
Plate & Welding Division General American Transportation Corp., 135 S. LaSalle Street, Chicago 90, Ill.	436, 442
Platecoil Division Tranter Manufacturing, Inc., Lansing, Mich.	1206, 1208
Pocono Fabricators, Inc., 105 Warren St., E. Stroudsburg, Pa.	188, 215
Podbielnik, Inc., 341 E. Ohio St., Chicago 11, Ill.	595
Popper & Sons, Inc., 300 Fourth Ave., New York 10, N. Y.	864
Porter Company, Inc., H. K., W-S Fittings Division, P.O. Box 95, Roselle, N. J.	1195
Potter Aeronautical Corporation, P.O. Box 532, Route 22, Union, N. J.	396
Potter and Rayfield, Inc., Stainless Steel Tank Div., Atlanta, Georgia	1341
Potts Company, Horace T., Speedline Stainless Steel Fittings Division, Erie Ave. & D. Sts., Philadelphia 34, Pa.	980
Powell Company, The Wm., 2503-31 Spring Grove Ave., Cincinnati 22, Ohio	133
Prater Pulverizer Company, 1515 So. 55th Court, Chicago 50, Ill.	904, 906
Precision Chemical Pump Corporation, 1396 Main St., Waltham, Mass.	1198
Precision Scientific Company, 3737 W. Cortland St., Chicago 47, Ill.	370, 372
Pressed Steel Tank Company, 1445 South 66th St., Milwaukee 14, Wis.	631
Pressure Products Industries, Inc., Hatboro, Pa.	1180
Proctor & Schwartz, Inc., Seventh St. & Tabor Road, Philadelphia 20, Pa.	684
Productive Equipment Corporation, 2926 W. Lake St., Chicago 12, Ill.	224
Progressive Architecture, 430 Park Ave., New York 22, N. Y.	86
Proprietaryes, Inc., 345 Harris Ave., Providence 1, R. I.	660
Protectoseal Company, The, 1920 South Western Ave., Chicago 8, Ill.	1286
Pulva Corporation, 550 High St., Perth Amboy, N. J.	220
Pulverizing Machinery Division Metals Disintegrating Company, Inc., Chatham Road, Summit, N. J.	632
Putman Publishing Company, 111 E. Delaware Place, Chicago 11, Ill.	880

Q

Quaker Oats Company, The, Chemicals Department, Merchandise Mart Plaza, Chicago 54, Ill.	953
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R

Ramo-Wooldridge Corp., P.O. Box 45215 Airport Sta., Los Angeles 45, Calif.	1068, 1453
Raybestos-Manhattan, Inc., Passaic, N. J.	820
Raymond Corporation, The, Greene, N. Y.	1212



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Raymond Division Combustion Engineering, Inc. , 1315 N. Branch St., Chicago 22, Ill.	646
Reaction Motors, Inc. , Ford Road, Denville, N. J.	1435
Read Standard Division of Capitol Products Corp. , York, Pa.	162
Reeves Pulley Company Division of Reliance Electric & Engineering Company , 1225 Seventh Street, Columbus, Indiana	1285, 1287
Reinhold Publishing Corporation , 430 Park Ave., New York 22, N. Y.	86
Reliance Electric & Engineering Company , 24701 Euclid Ave., Cleveland 17, Ohio	1285, 1287
Rem-Cru Titanium, Inc. , Midland, Pa.	1259, 1261
Renneburg & Sons Company, Edw. , 2639 Boston St., Baltimore 24, Md.	1078
Republic Lead Equipment Company , Cleveland, Ohio	111
Republic Seitz Filter Corporation , 17 Stone St., Newark 4, N. J.	977
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Research Controls , 7900 East 11th St. (Box 5035) Tulsa, Okla.	1186
Resistoflex Corporation , Woodland Road, Roseland, N. J.	889, 891
Reynolds Metals Company , 2500 So. 3d St., Louisville 1, Ky.	1348, 1367, 1369
Rheem Manufacturing Company , 1701 W. Edgar Rd., Linden, N. J.	808, 810
Richardson Scale Company , Clifton, N. J.	1151, 1153
Richmond Manufacturing Company , Lockport, N. Y.	445
Rietz Manufacturing Co. , Box 690, West Chester, Pa.	1231
Robbins & Myers, Inc. , Moyno Pump Division, Springfield, Ohio	1254
Robertshaw-Fulton Controls Company , Instrument Division, 2920 N. 4th St., Philadelphia 33, Pa.	1366, 1368
Rochester Manufacturing Company, Inc. , 100 Rockwood St., Rochester 10, N. Y.	943
Rocket Engine Section, Flight Propulsion Laboratory Department, AGT Division, General Electric Company , Cincinnati 15, Ohio	1430
Rockwell Manufacturing Company , 400 N. Lexington Ave., Pittsburgh 8, Pa.	843
Rockwood Sprinkler Company , 38 Harlow St., Worcester 5, Mass.	1296, 1298
Ross & Son Company, Inc., Charles , 148-156 Classon Ave., Brooklyn 5, N. Y.	983
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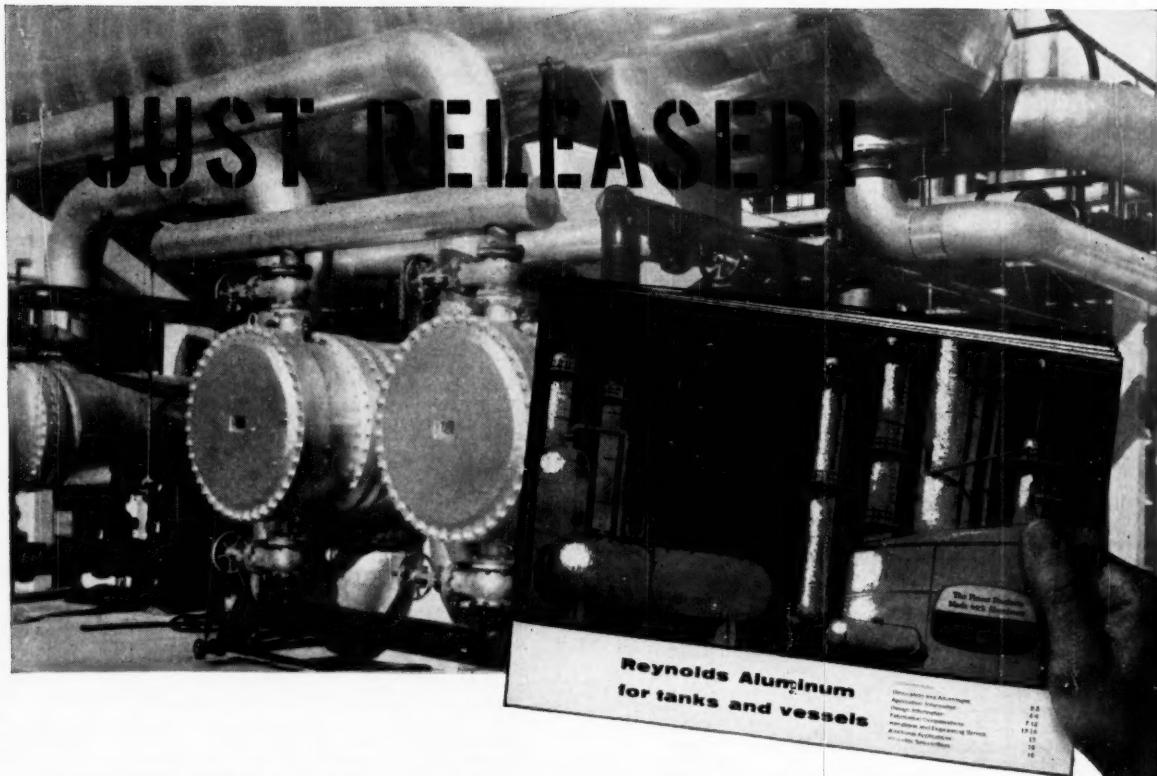
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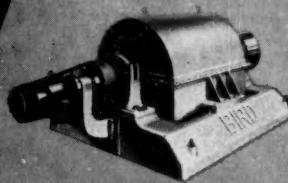
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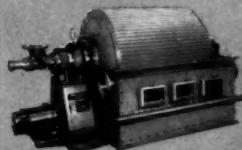
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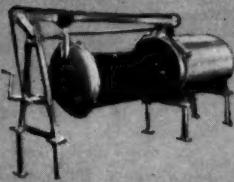
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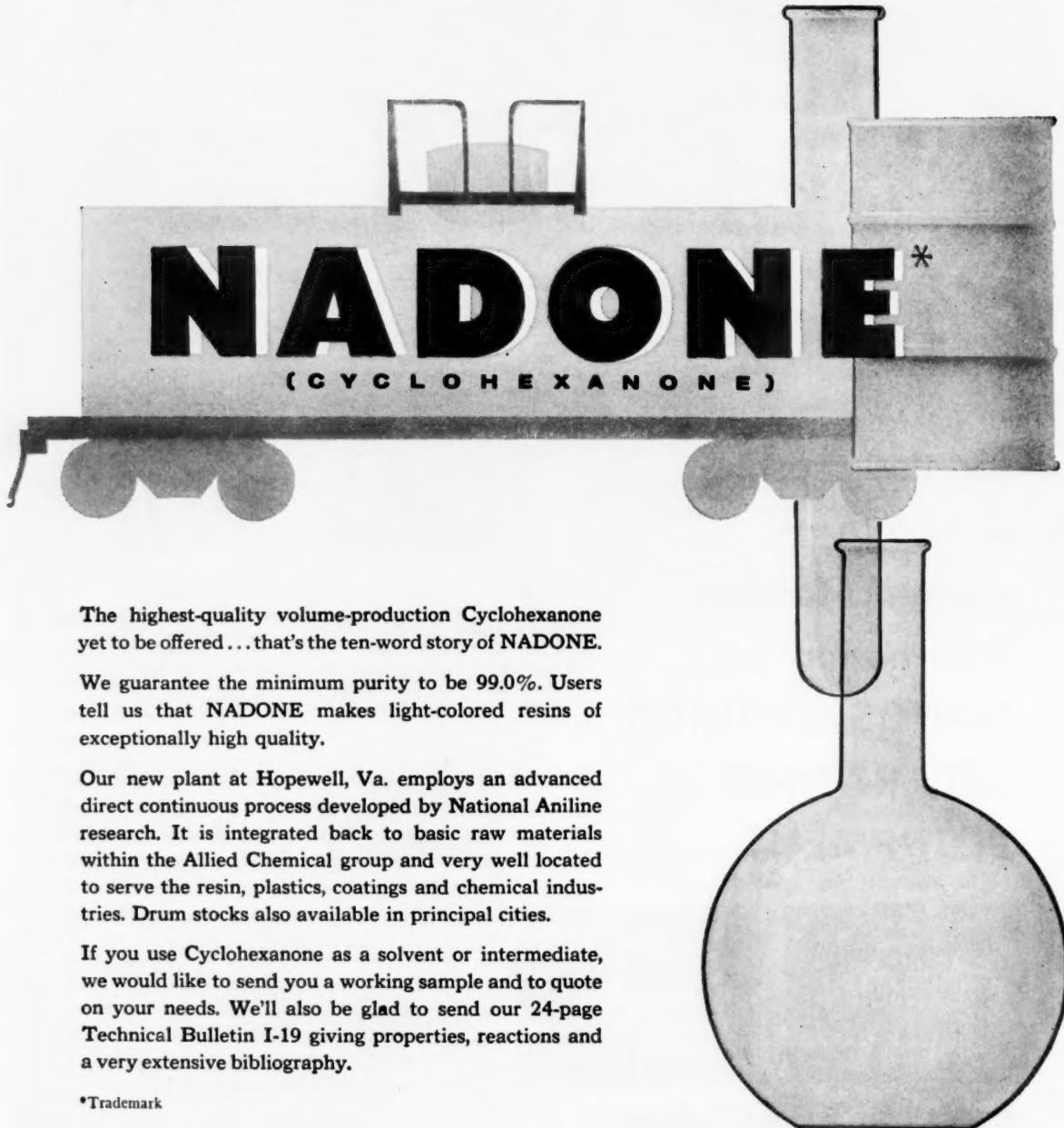
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Chemshow Highlights New Equipment

With the opening next week of the 26th Exposition of Chemical Industries, New York's Coliseum will become the rallying point for an estimated 35,000-40,000 chemical executives, engineers and chemists from all parts of the U.S. and dozens of foreign countries. What you'll find there is the biggest assortment of chemical products, equipment and instrumentation ever assembled for this stellar biennial attraction.

Tangible evidence of the Chemical Process Industries' dynamic growth will be displayed in more than 650 exhibits spread throughout all four exhibit floors of the coliseum. And, as always, the Chemshow is certain to have something for everyone—regardless of their special field of interest. Some of the new things exhibited:

New Chemicals and Derivatives: For the first time at a Chemshow, most chemical products will be grouped, on the third floor of the coliseum, in one of three separate display sections (the others: Laboratory Equipment, second floor; Rocket and Satellite Sec-

tion, fourth floor). One of the newest product lines on display will be Callery Chemical Co.'s amine boranes, soon to be available in bulk for use as antioxidants, catalysts, stabilizing and biological agents. Sharing the spotlight will be Callery's trimethoxyboroxine ((TMB, for short)—a metal-fire extinguisher for smothering magnesium, titanium and zirconium fires.

Dow Chemical Co.'s Magnesium Dept. will feature an exhibit of magnesium suspensions. Designed for such new process uses as production of high-energy fuels and organometallic compounds, and reduction of high-purity titanium, beryllium, zirconium and uranium metals, they're made in 20-mesh to 0.1-micron sizes. Also on display: Ansul Chemical Co.'s new nitrogen heterocyclic products; American Hydrotherm Corp.'s broad-range (0-670 F) aryl silicate heat transfer media; eight recent additions to Victor Chemical Works' line of phosphorus-containing compounds.

Metals and Construction Materials: The CPI's reward for its intensive

efforts in the development of new metals (*see p. 47A*) and plastics will be readily evident in the form of numerous items now offered in most of these new materials. Columbia-National Corp. will show off, for the first time, zirconium sponge, ingots and mill and finished products now available in commercial quantity. And at the Carborundum Metals Co. booth, you'll see the first heat exchanger, valve, reaction vessel and thermowell of all-zirconium construction.

To prove the corrosion resistance of titanium, Mallory-Sharon Titanium Corp. will demonstrate the ability of titanium pump shafts to withstand attack by ferric chloride solutions that cause other metals to fail in minutes. And if you're looking for unusual, special-purpose metals, you can find high-purity gallium (used for gallium arsenide semiconductors) at Alcoa's booth, capacitor-grade tantalum and newly developed 99.5% columbium metal at the display of Kennametal, Inc.

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X **Dairy Carton Coaters** add it to waxes for their cartons, getting longer shelf life and reducing flaking, leaking and bulging!

X **Food Packagers** like the smarter, glossier appearance of their packages—less rub-off and scuff. Printing looks better, too!

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Chemshow Highlights

also be well represented at the Chemshow both in standard stock forms and in fabricated equipment. And for show visitors who think they know the standard answers to corrosion problems, International Nickel Co. will provide a push-button quiz machine to test their skill at selecting alloys.

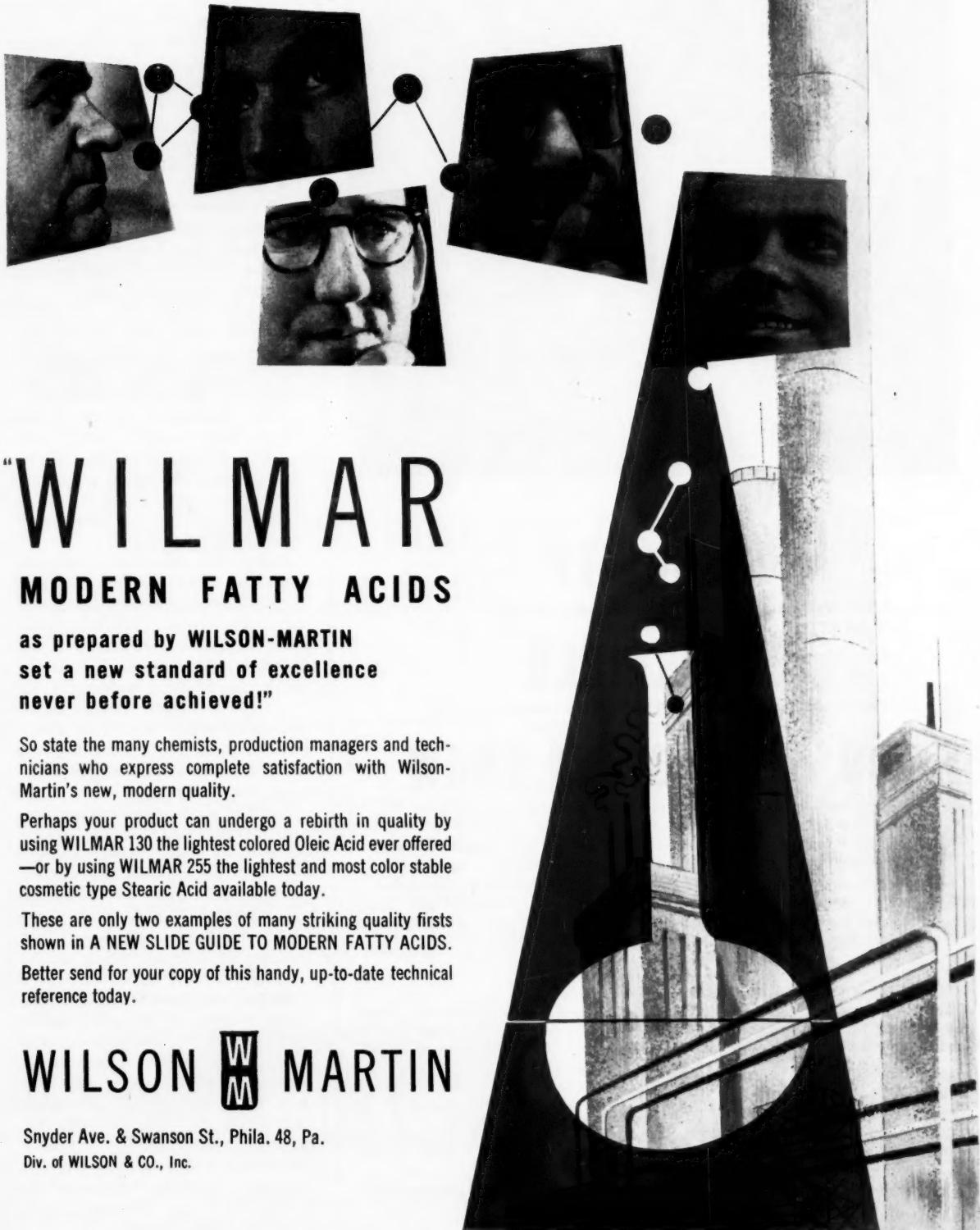
Among the newest applications of plastic materials will be Ethylene Chemical Corp.'s Chemipipe—a new line of Teflon-lined steel pipe and fittings making its public debut at the Chemshow. The growing use of the hard plastics as materials of construction will be highlighted by a number of unusual examples. Luzerne Rubber Co., for one, will show off several intricate parts custom-molded of PVC, including a 15-lb. molding that, it claims, is the largest ever made.

Instruments, Laboratory Equipment: Of the hundreds of instruments on view in the coliseum, several that are sure to attract many visitors are the gas chromatographs developed in the two years since the last Chemshow. Perkin Elmer, for example, will be showing its recently unveiled process vapor fractometer designed for on-stream analysis of chemical and petrochemical products. Representing Podbieliak's chromatographic equipment at the show will be two operating Chromanettes. Made in lightweight portable models for field use and on-the-spot testing, these units span the boiling-point range from —180 C to 80 C, are said to have separation efficiencies of better than 8,000 plates.

Applied Research Laboratories' newest offering in the continuous-analyzer line is Quantrol—a system that employs X-ray fluorescence to continuously monitor a single element in a process stream. Other new continuous processing aids: Norcross Corp.'s pipeline viscometer, which automatically records viscosity changes during polymerization or other types of reactions; Brabender Corp.'s ultra-rapid moisture recorder, which automatically checks material every 12 minutes for optimum moisture control.

Equipment: Far outnumbering all other exhibits at the Chemshow will be thousands of equipment items—ranging from the smallest valves and fittings to large completely integrated processing units. Biggest unit expected at the show will be a 3x16-ft. rotary dryer—the smallest size made by

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Chemshow Highlights

Standard Steel Corp. (Los Angeles).

In addition to the standard equipment systems and components that never cease to appeal to mechanically minded show-goers, many new units will be on public display for the first time. Among the latter are three—(1) a Pulvocron air-attrition pulverizer, (2) the Turbulizer dispersion mill, (3) a new triple-action mixer—designed especially for the process industries by The Strong-Scott Mfg. Co.

The Sharples Corp. will also introduce three new units—all high-speed centrifuges designed to meet the growing demand for high-pressure, high-temperature operation.

National Engineering Co. will show its new Elevator, an elevator-aerator for quick discharge and carry-away of material from all sizes of Simpson Mix-Mullers. Another operating elevating-conveying system—Link-Belt's Bulk-Flo—will be featured in a materials-handling display of oscillating and screw conveyors. One of the screw conveyors will recycle material to a "see-through" Roto-Louvre Dryer.

Other firms that will use working models as attention-getters are Combustion Engineering, with a flash drying system; General American Transportation, with a continuous fluidized-bed dryer for heat-sensitive materials and a scale-model Airslide car. Fluor Products Co. will demonstrate an air classifying system made by Fluor-Hartmann under a recent licensing agreement with Maschinenfabrik Hartmann AG. (Germany).

Another see-through display, Peabody Engineering Corp.'s plastic model of its newest industrial scrubber, will demonstrate improved removal of fine fumes and submicron dust from gas streams. Also in the scrubber class: Ducon's Type UW-4 Dynamic air scrubber, which will be on display for the first time.

Rockets and Satellites: And there's visual evidence of the CPI's sizable stake in the rocket field. Thiokol will exhibit some of the newest rocket engines; Atlantic Research Corp. will show PET—a small solid-propellant rocket, recently made available for industrial application; GE's Missile and Ordnance Systems Dept. will display such auxilliary equipment as fluid-stabilized arcs, solar furnace and gas-heated shock tunnel.



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No embrittlement! Lowest cost! ASME Code approved!

In the subzero operating range . . .
Specify Alcoa Aluminum equipment and piping

The flow chart details a tonnage oxygen plant now in actual operation where process temperatures average below minus 300° F. Notice that virtually all of the equipment and process piping are ALCOA® Aluminum. There's a good reason: aluminum is the lowest cost metal able to perform satisfactorily at low temperatures.

At subzero temperatures, ASME code approved aluminum alloys suitable for welded construction display improved yield and tensile strengths with no reduction in ductility or resistance to shock loading (see graphs). There is no embrittlement!

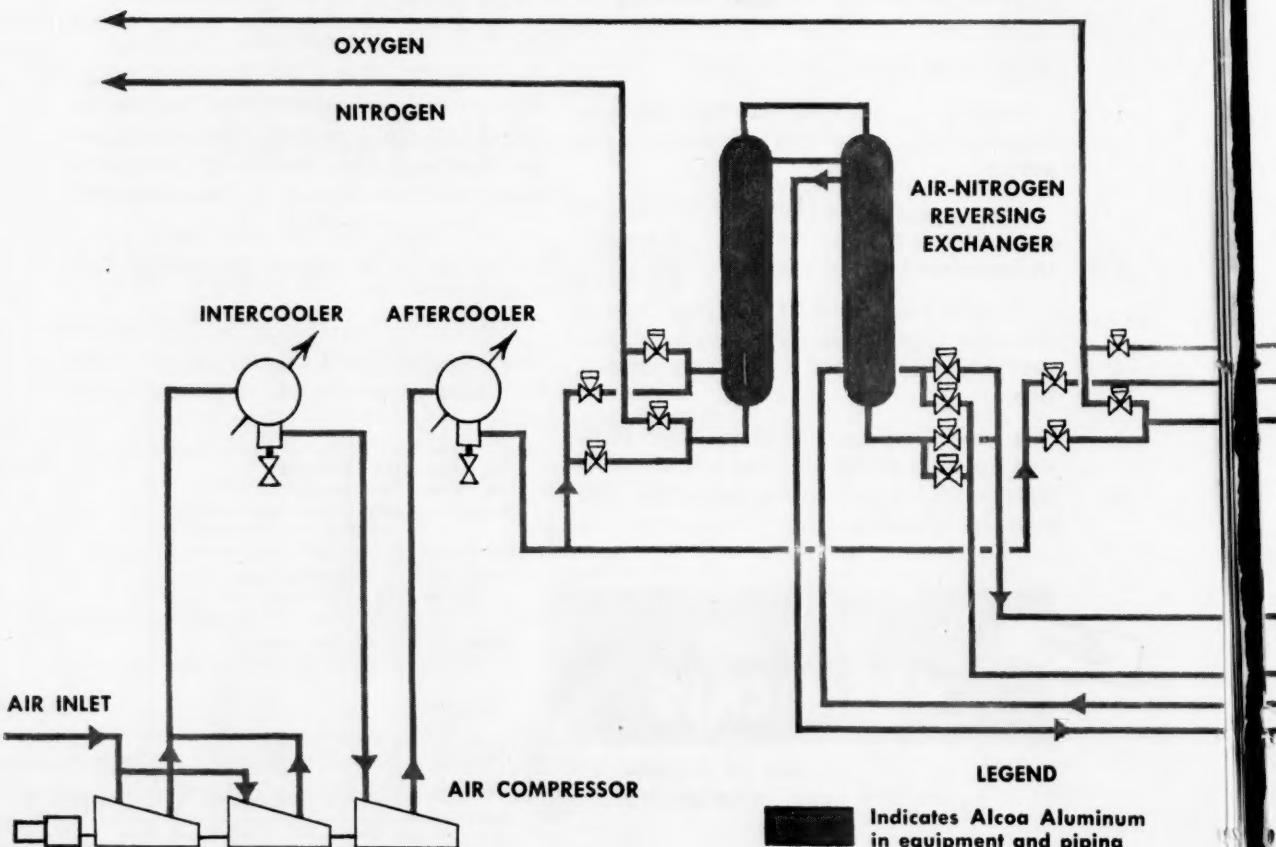
And in these operating temperature ranges, aluminum offers other valuable benefits . . . light weight

. . . excellent resistance to corrosion . . . great strength in alloys . . . high thermal conductivity . . . non-magnetic, nonsparking characteristics . . . nontoxicity . . . and excellent reflectivity. It is highly workable and lends itself readily to a variety of welding or brazing techniques for easy fabrication.

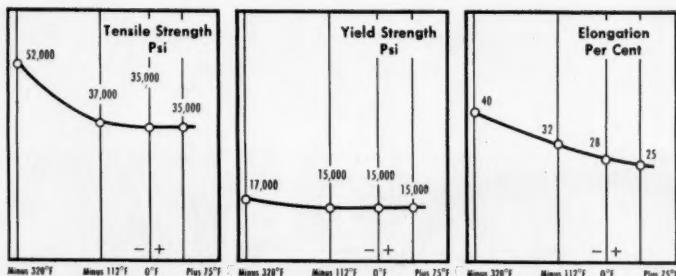
When you are looking for a low cost answer to the many problems of satisfactory equipment and piping performance in low temperature operations, *it will pay you to specify Alcoa Aluminum*. ALCOA engineers have worked with aluminum in the process industries for over 30 years. Use their accumulated knowledge to help you find satisfactory answers to your process equipment problems. Consult the nearby ALCOA sales office listed in the Yellow Pages of your telephone directory . . . or outline your equipment requirements in a letter to ALUMINUM COMPANY OF AMERICA, 906-L Alcoa Building, Pittsburgh 19, Pa.



THIS FREE BOOK is filled with detailed data on the behavior of aluminum in the process industries . . . the result of more than 30 years of Alcoa engineering experience with aluminum in a variety of applications in nearly every temperature range. Use it as your guide to trouble-free, corrosion-free process equipment and piping. Write today for Process Industries Applications of Alcoa Aluminum.

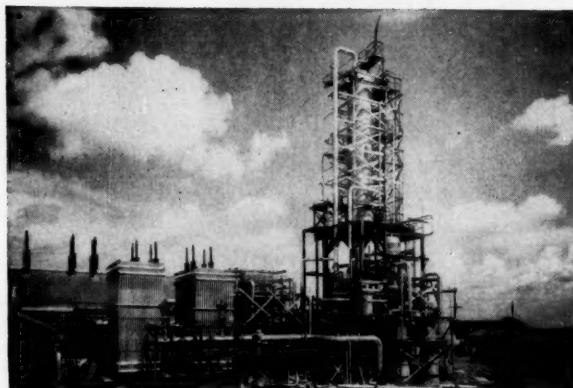


Indicates Alcoa Aluminum
in equipment and piping



LOW TEMPERATURE PROPERTIES OF ALCOA ALLOY 5154-0

Alcoa Aluminum actually increases in strength with no loss in ductility as temperatures drop to minus 320°F and below. Alloy 5154-0, for example, improves 50% in tensile strength, over 13% in yield strength and approximately 60% in elongation.



Photograph shows installation of Alcoa Aluminum equipment and piping in oxygen plant detailed in flow diagram. Harp-type heat exchangers (left) are dip-brazed assemblies with thousands of fins for best heat transfer.

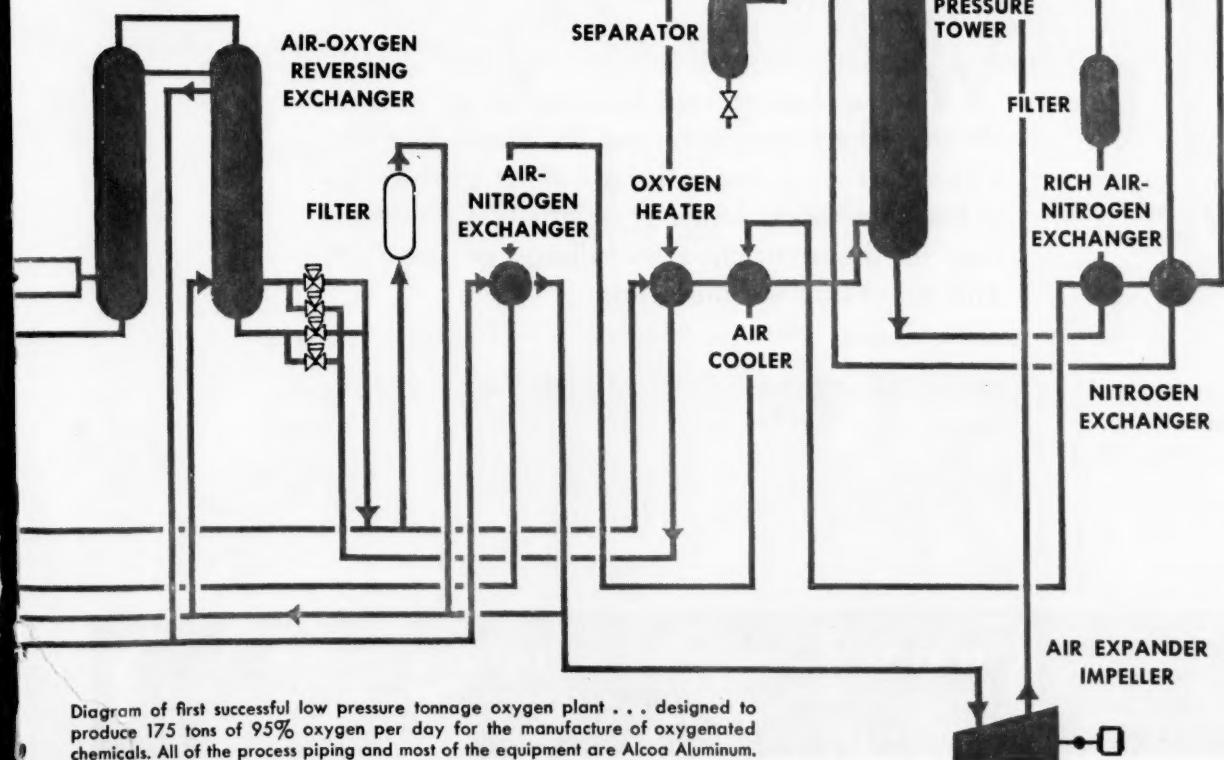


Diagram of first successful low pressure tonnage oxygen plant . . . designed to produce 175 tons of 95% oxygen per day for the manufacture of oxygenated chemicals. All of the process piping and most of the equipment are Alcoa Aluminum.



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steel Co.)
Rare Earths—
Minerals Co., Inc.

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West Chicago, Illinois
Thorium and Rare Earths
Lithium Corp. of America
Minneapolis, Minn.
Lithium
Arthur D. Little, Inc.
Cambridge, Mass.

Metals

Titanium Metals Co.
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Titanium
Union Carbide Nuclear
New York, N. Y.
Uranium
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FINAL
CHEMSHOW
COVERAGE



FOR 78 COMPANIES . . .

ATOM-AGE METALS SNARE THE AWARD

1957

Next Tuesday at New York's Waldorf-Astoria, 78 chemical process firms, engineering organizations and laboratories will receive Chemical Engineering's 14th award for chemical engineering achievements. The award this year is well-deserved recognition of the accomplishments in atomic age metallurgy of some 1,800 chemical engineers, whose collective effort has made possible the construction of almost \$4 billion worth of new plants.

BACK around the turn of the century when William Walker and his partner, Arthur Little, were originating ideas that would later be formalized into the unit operations concept, the infant chemical engineering profession was drawing heavily for its know-how on the field of extractive metallurgy. In fact, many of the present-day unit operations—crushing and grinding, flotation

and sedimentation—can trace their lineage directly to the primitive techniques of the 16th century metallurgists.

Now, in its 50th year as an organized profession, chemical engineering is repaying the debt, giving the metallurgist a whole new bag of tricks. Solvent extraction, chemical precipitation, ion exchange, chromato-

1957 AWARD WINNERS

- Allied Chemical & Dye Corp.
 Aluminum Co. of America
 American Cyanamid Co.
 American Potash & Chemical Co.
 Ames Laboratory, U.S.A.E.C.
 Anaconda Co.
 Argonne National Laboratory
 Battelle Memorial Institute
 Beryllium Corp. of America
 Blaw-Knox Co.
 Blockson Chemical Co.
 Brookhaven National Laboratory
 Brush Beryllium Co.
 Callery Chemical Co.
 Carborundum Metals Co., The
 Catalytic Construction Co.
 Chemical Construction Corp.
 Climax Uranium Co.
 Columbia-National Corp.
 Columbia-Southern Chemical Corp.
 Crane Co.
 Dorr-Oliver, Inc.
 Dow Chemical Co., The
 E. I. duPont deNemours & Co., Inc.
 Electro Metallurgical Co. (Div. Union Carbide Corp.)
 Fansteel Metallurgical Corp.
 Foote Mineral Co.
 Freeport Sulphur Co.
- General Electric Co.
 Goodyear Atomic Corp. (Div. The Goodyear Tire and Rubber Co.)
 W. R. Grace Co.
 Harshaw Chemical Co., The
 Hooker Electrochemical Co.
 Horizons Incorporated
 International Minerals & Chemical Corp.
 International Nickel Co. of Canada, Ltd.
 Kaiser Aluminum & Chemical Corp.
 Kawecki Chemical Co.
 Kennametal, Inc.
 Kerr-McGee Oil Industries, Inc.
 Knowles Associates
 Lindsay Chemical Co.
 Lithium Corp. of America
 Arthur D. Little, Inc.
 Los Alamos Scientific Laboratory
 Mallinckrodt Chemical Works
 Maywood Chemical Works
 Metal Hydrides, Inc.
 Mines Development, Inc.
 National Research Corp.
 National Lead Co.
 Nuclear Metals, Inc.
 Oak Ridge Laboratories (of Union Carbide Nuclear Co.)
- Olin Mathieson Chemical Corp.
 Permutit Co., The
 Phillips Petroleum Co.
 Quebec Iron and Titanium Corp.
 Reynolds Metals Co.
 Rohm & Haas Co.
 Rust Engineering Co.
 Sherritt-Gordon Mines, Ltd.
 Singmaster & Breyer
 Stanford Research Institute
 Stauffer Chemical Co.
 Stearns-Rogers Manufacturing Co.
 Titanium Metals Corp. of America
 Union Carbide Nuclear Co.
 United States Borax and Chemical Corp.
 U. S. Bureau of Mines
 U. S. Industrial Chemicals Div., National Distillers and Chemical Corp.
 U. S. Phosphoric Products Div., Tennessee Corp.
 Uranium Reduction Co.
 Vanadium Corp. of America
 Virginia-Carolina Chemical Co.
 Vitro Corp. of America
 Wah Chang Corp.
 Western-Knapp Engineering Co.
 Westinghouse Electric Corp.

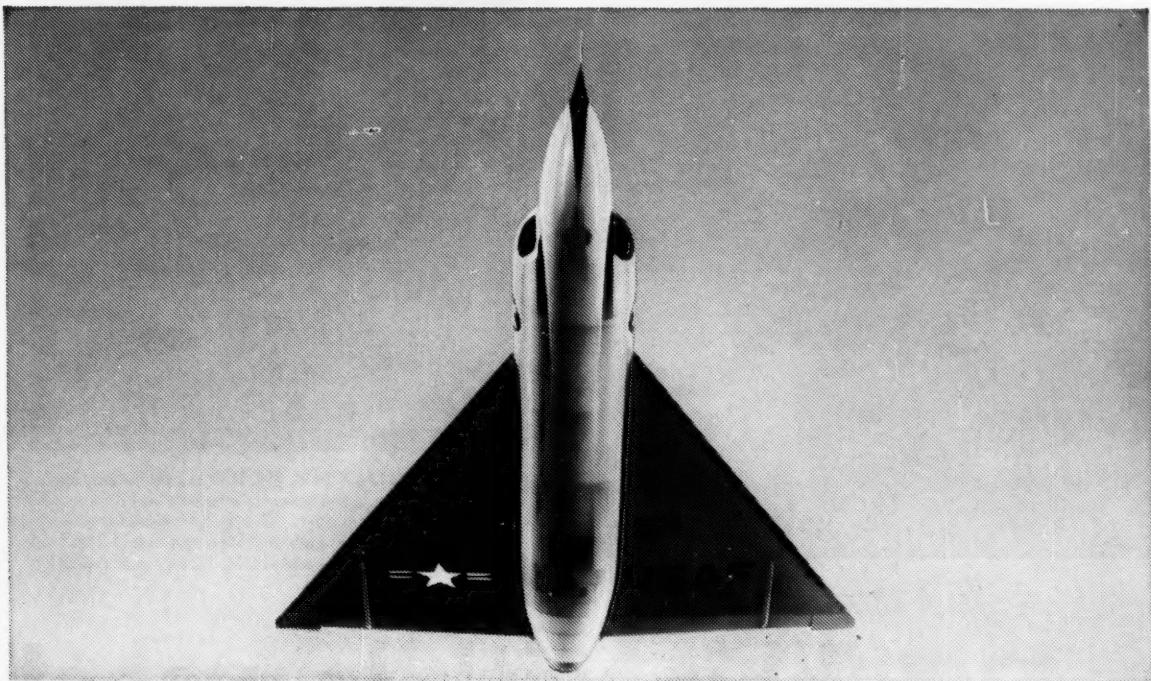
graphy, even gaseous diffusion, are playing an increasingly important role in winning metals from their ores. And, in recognition of that, *Chemical Engineering* magazine next week will present its Chemical Engineering Achievement Award to 78 organizations "for their pioneering applications of chemical engineering principles and processes to the extractive metallurgy of atomic age metals." Says Sidney Kirkpatrick, editorial director of *Chemical Engineering* (and *CHEMICAL WEEK*): "We are starting to pay off our historic debt to extractive metallurgy."

The award committee, made up of 90 senior chem-

ical engineering educators, chose metals accomplishment by a near-unanimous vote. Citations included those for the so-called atomic metals: uranium, plutonium, zirconium, hafnium, tantalum, columbium, lithium, boron, beryllium, thorium and the rare-earth metals. And because they are primarily products of chemical processing and important to the nuclear industry, three "older" metals were named: aluminum, nickel and titanium.

The 78 organizations named in the award (*see list above*) report that approximately 1,800 chemical engineers took part in the developments. Almost \$4 billion worth of plants were built as a result of their work in

when you need



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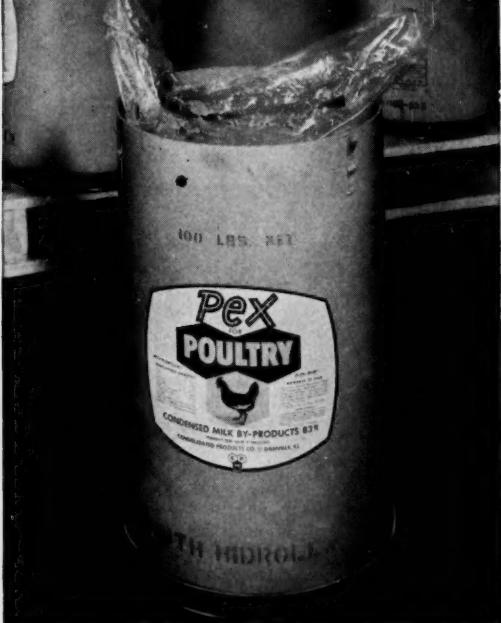
CHEMICAL ENGINEERING'S "Achievement Award"



for accomplishments in Extractive Metallurgy



ANTIBIOTICS are packaged in double polyethylene bags, with inside bag and inner wall of outside bag completely sterile. Polyethylene packaging eliminated fragile containers, cut storage $\frac{1}{2}$, freight cost $\frac{1}{3}$.



POULTRY FEED receives maximum protection in polyethylene bag and lightweight fiber container. The polyethylene bag safeguards the high moisture content of the feed on the inside and shields it from contamination on the outside.

ship with low-cost

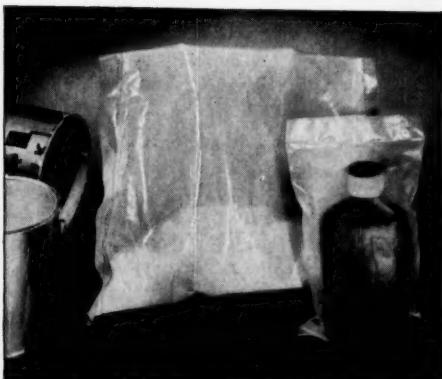


SKIN CLEANSER is protected from air and moisture by this unsupported film bag that remains unaffected by cleansing agents. Label and directions are clearly printed.

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polyethylene film liners

Cut packaging costs for liquids and solids with lightweight boxes, drums, cans, and bags

Sales up...profits down? Fight the squeeze by improving your packaging efficiency. Protect both profit and product with low-cost film made from BAKELITE Brand Polyethylene. Polyethylene film assures maximum protection on the inside and permits the use of less expensive packaging containers on the outside. And too, more convenient and efficient packaging not only cuts costs but it also builds easier customer acceptance for extra sales.

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Your product's purity is safe. Film bags and liners made from BAKELITE Brand Polyethylene can be used in contact with most chemicals because it is highly inert. It is impervious to moisture and immune to fungus attack. It is also strong, flexible and easy to use. It takes a quick, secure heat seal even when the film is dust covered.

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	ZINC ACETATE powder

CAPRYLATES

AMMONIUM CAPRYLATE 50% solution	COPPER CAPRYLATE powder
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	ZINC CAPRYLATE powder

FORMATES

ALUMINUM FORMATE powder	COPPER FORMATE crystals
AMMONIUM FORMATE 50% solution	POTASSIUM FORMATE 50% solution
	ZINC FORMATE powder

GLUCONATES

COBALT GLUCONATE (Co 11%)	FERROUS GLUCONATE (Fe 11.5%)
COPPER GLUCONATE (Cu 14%)	MANGANESE GLUCONATE (Mn 11.4%)
	ZINC GLUCONATE (Zn 14%)

LACTATES

ALUMINUM LACTATE powder
AMMONIUM LACTATE 50% solution
CALCIUM LACTATE powder
POTASSIUM LACTATE 50% solution
SODIUM LACTATE 50% solution

The Acetates are widely employed in textile dyeing and stripping; leather tanning; plating; mildew proofing; rosin liming; photography; pigment manufacture; silver polishes; as antibiotic nutrients, humectants and mold inhibitors; in the manufacture of magnesium soaps and in organic syntheses.

Formates are used in textile dyeing; noble metal manufacture; mildew proofing; rubber compounding; water-repellent finishes and as fungicides.

The gluconates are suggested for evaluation as catalysts wherever inorganic salts of the various metals are currently used.

The Caprylates are employed as fungicides and are suggested for evaluation in rubber compounds.

Lactates are used in food processing. The Potassium and Sodium salts have been employed as humectants and plasticizers for casein solutions, in calico printing and as corrosion inhibitors.

See us at Booth No. 962 at the Chemical Exposition to learn about our facilities for the custom manufacture of chemicals.

C E Award

process development, design and construction. It adds up to a market for chemical products and processing equipment of close to \$500 million a year. The processing of 200 million tons/year of nonferrous metal ore means a \$60-65 million annual market for chemicals alone, according to an independent estimate.

Half for Uranium: More than half the organizations in the prize-winning group were cited for contributions in uranium ore processing. Principal chemical engineering contributions, in order of commercial development: chemical precipitation, column ion exchange, resin-in-pulp ion exchange for slimy ores, and liquid-liquid extractions using organic solvents.

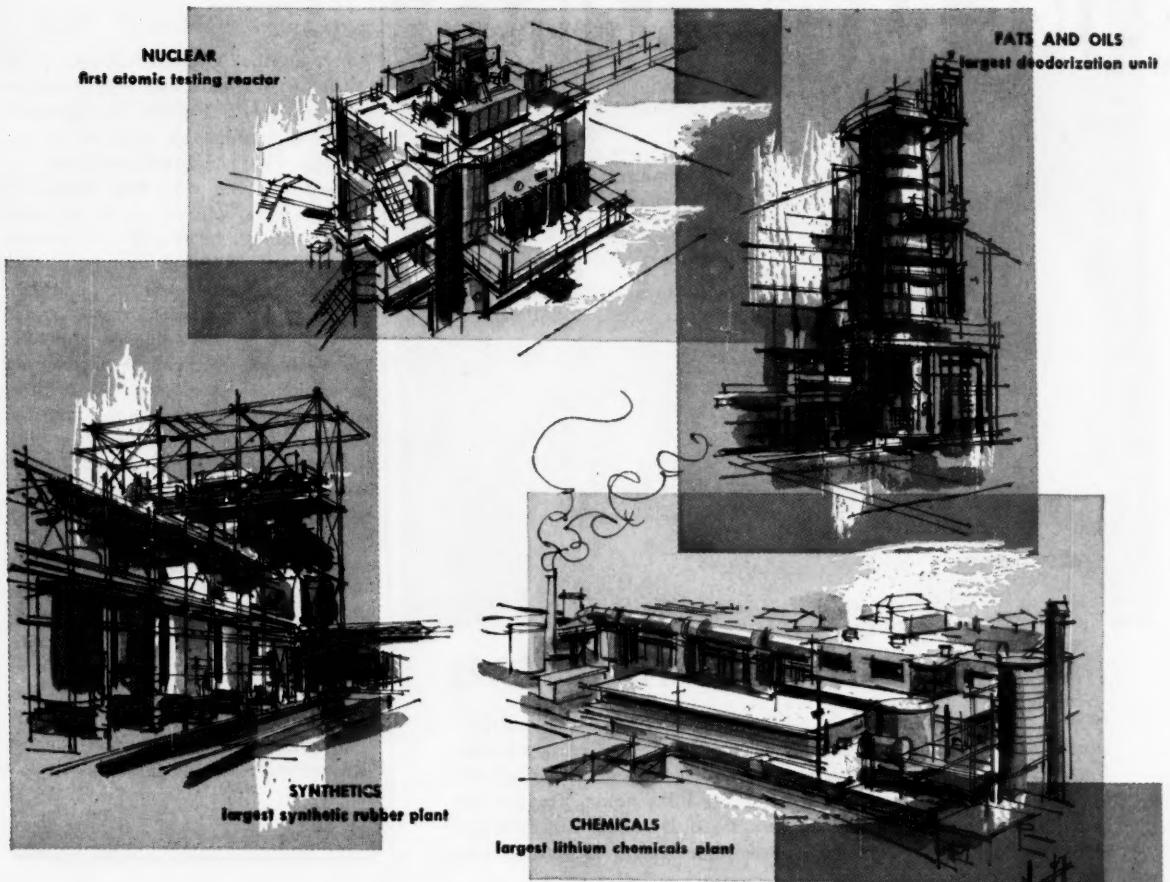
Ion-exchange and solvent extraction together are today responsible for 80% of the non-Communist nations' production of uranium. Their adaptation to the job has slashed the normal ore processing cost in half, a saving that's measured in hundreds of millions of dollars/year.

But though uranium got the most mentions, the award committee did not overlook the part that chemical engineering played in the development of other materials used in the nuclear energy program, such as zirconium, hafnium, columbium and thorium. Nor did it forget that the development of materials such as lithium and boron has added new dimensions to the nation's high-energy fuels program or that the whole field of metal development is making possible the production of new materials of construction to stand up under the rigorous conditions met in the missiles and other fields.

By including aluminum in the citations, the committee is recognizing that chemical processing techniques for metal production were first applied to that metal. Up to the time that aluminum was developed, the accepted procedure had been to separate the ore into an impure metal and a slag that would frequently be valuable. Aluminum engineers, however, used chemical methods quantitatively to make a pure alumina from bauxite.

Chemical metallurgy has come a long way since then. Dr. Zay Jeffries, distinguished metallurgical engineer, will outline some of this progress when he delivers his keynote address at the award dinner next Tues-

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C E Award

day at the Waldorf-Astoria. Title: "Chemical Engineering and Extractive Metallurgy—a Fruitful Partnership." And Jesse Johnson, director of the Atomic Energy Commission's raw materials division, who will accept the awards on behalf of all the honored organizations, foresees the further use of solvent-extraction techniques for other important metals.

There are indications that even the steel industry may find it profitable to apply more chemical engineering operations in the reduction of iron ore. Fluidized-bed techniques and the direct reduction of iron ore with hydrogen hold great promise for steelmakers.

Where Credit Is Due: By becoming the third group to receive the *Chemical Engineering* Achievement Award (table, below), the 78 organizations find themselves in some high-stepping company. None of them will minimize the benefits that have accrued to chemistry from the metals field. But it bodes well for the future of metals that chemical engineers feel such a strong sense of obligation.

Previous Award Winners

YEAR WINNER	ACHIEVEMENT
1933 Carbide and Carbon Chemicals	Synthetic chemicals from petroleum and natural gas
1935 Du Pont	Development of neoprene, synthetic camphor and other chemicals
1937 Monsanto	Elemental phosphorus
1939 Standard Oil Development	Aviation gasoline, other products from petroleum
1941 Dow	Magnesium from sea water
1943 67 Companies	Building a synthetic rubber industry in 24 months
1946 122 Companies	Atomic bomb project
1947 Merck	Streptomycin, other medicinals
1948 Shell Development	Synthetic glycerine
1948 Celanese	Chemical engineering integration of textile, plastics and chemical operations
1951 Phillips Petroleum	High-abrasion carbon blacks, cold rubber
1953 Carbide and Carbon Chemicals	Piloting high-pressure coal hydrogasification
1955 Dow Corning	Chemical engineering participation in commercial development of silicones

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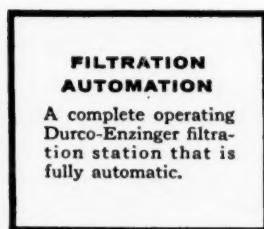


THE DURIRON COMPANY, INC. / Dayton, Ohio

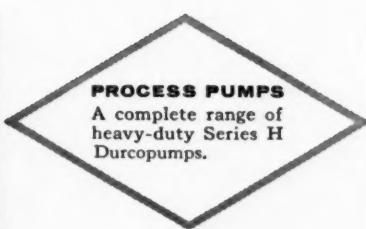
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FINAL CHEMSHOW COVERAGE

New York—with or without a Chemshow—is a pretty big place. How to get the most out of both show and city in a limited time is easier if you know your way around. Here are a few tips about the show, New York Coliseum, transportation, hotels, restaurants and entertainment to get you started.



About the Chemshow—and New York

For thousands of the chemical industry's executives, engineers and chemists, the Chemshow at the New York Coliseum will overshadow all other events on New York City's calendar for next week. It will be the biggest Chemshow yet, and will mark the biennial event's return to New York after an absence for four years.

The first way to save time: remember the show's schedule. It will be open Tuesday, Wednesday and Friday from 10 a.m. to 6 p.m. The first day, Monday, Dec. 2, the show won't open till noon, but will remain open till 10 p.m. And on Thursday, the time is 10 a.m. to 10 p.m.

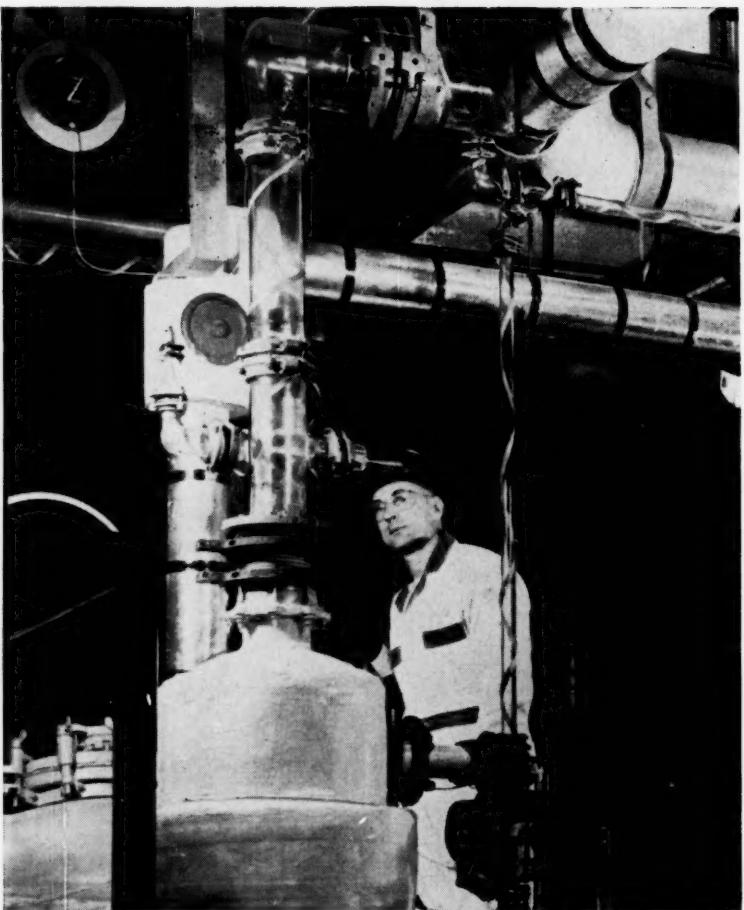
If you're lucky enough to be able to pick your day, experience shows that the first two days of the show draw the smallest crowds—so if you want to get around quickly, try to get there then. Thursday will probably be the busiest. And remember, by the end of the week most of the exhibitors will be weary from the long grind. So you'll probably get the most individual attention if you go early.

To the Coliseum: IRT Broadway-Seventh Ave. and Sixth and Eighth Ave. IND Independent subways (except E and F trains) stop right at the coliseum. The station: 59th St.-Columbus Circle. If you're staying at a west side hotel (e.g., Statler, Governor Clinton, McAlpin in Pennsylvania Station area, the new Manhattan and Astor in Times Square area) the subway route is probably best.

From the Grand Central Station, east side hotel area (e.g., Commodore, Roosevelt, Biltmore) the easiest public transportation route is the 42nd St. Surface Transportation System bus line. Bus marked "104 Broadway" stops right at the coliseum.

If you're staying at a Central Park area hotel (e.g., Park Sheraton, Essex House, Henry Hudson), the coliseum is only a short walk.

If you take a taxi, tell the driver you want to get out at Eighth Ave. and 58th St. The coliseum is just one block north, and you can probably save



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At this ether distillation operation in a Baker & Adamson plant precaution is the password; you can see it in the hat, the gloves, the static ground wrappings on the pipe . . . and the pipe itself.

The pipe is strong. You can't take chances with pure ether. "Double-Tough" PYREX Pipe is made to take pressure and heat and a goodly amount of mechanical abuse.

The pipe cannot corrode. Not from ether or from any other chemical but hydrofluoric acid and hot alkalies.

The pipe cannot contaminate: It's completely inert—vital when you're making an A.C.S. Reagent Grade chemical.

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About New York

yourself about five minutes since you avoid the usual traffic tie-up at Columbus Circle.

A reminder if you are driving in from New Jersey for the day: it's probably easier to leave your car in the Lincoln Tunnel parking lot, located at the junction of U. S. 1 and N. J. 3 and near the Jersey Turnpike's Lincoln Tunnel exit. Parking lot service includes round-trip bus ride to New York Port Authority Bus Terminal (a couple of minutes by subway from the coliseum). That way, you don't have to waste time looking for a spot to park in the city, can stay all day for the one price. Entire service costs \$1 (29¢ extra per person). But be careful—the lot closes for a few hours early in the morning.

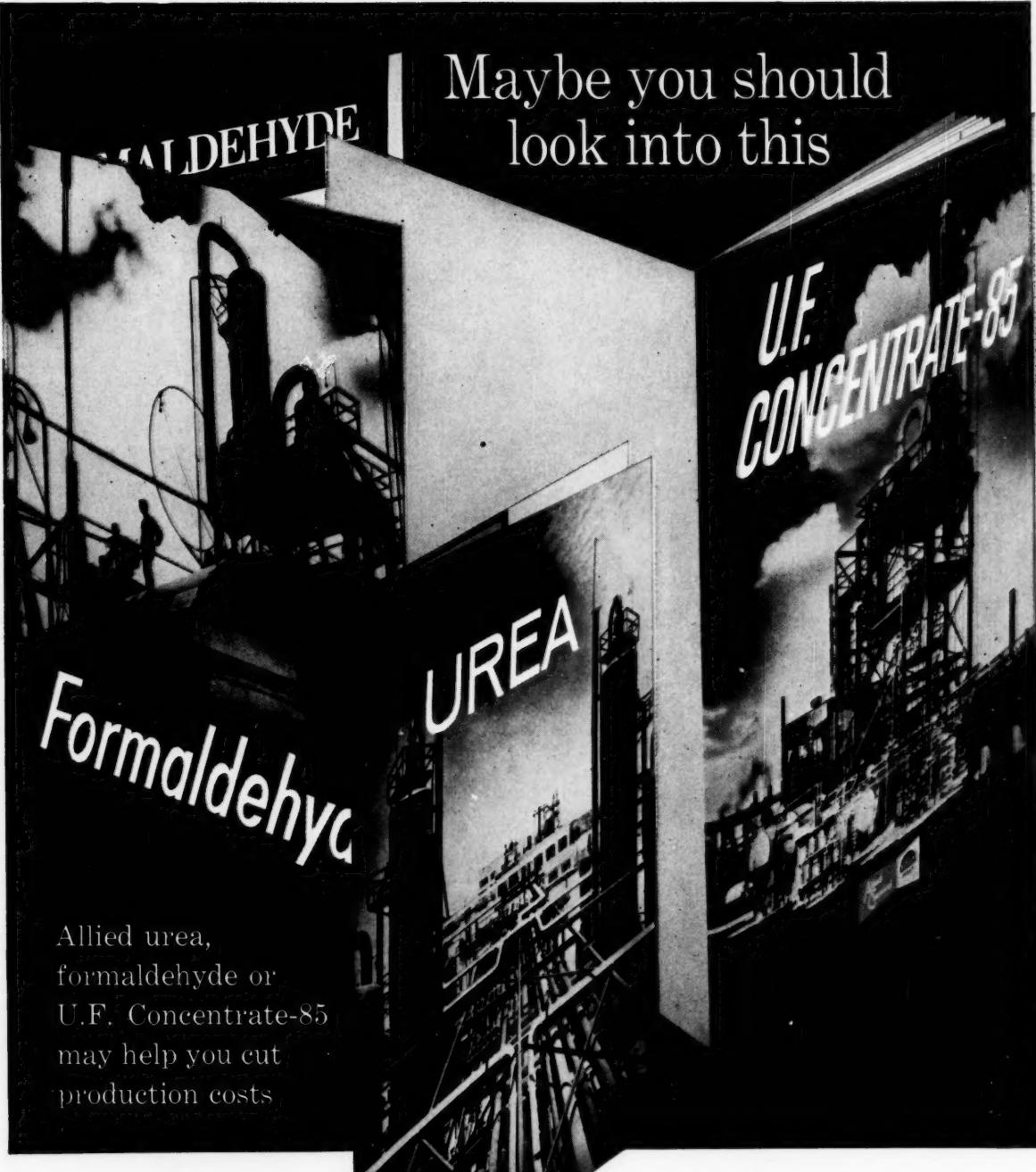
Extra-Curricular Activities: There'll be a lot to see and do in New York if you have time to spare. Theater tickets are available at the hotels. But you'll pay a brokers' fee (about \$1.30 including tax) for tickets, and you're out of luck—if you don't already have reservations—for the Broadway shows, "My Fair Lady," "Auntie Mame," "Jamaica," "Time Remastered" or "West Side Story."

A few tickets are sometimes available for "Bells Are Ringing." And if you want to take a chance on a single seat or two, or don't mind standing, try the theater box offices.

Tickets for sports events, concerts, some of the lesser hit shows and "off-Broadway" theater are easier to get.

Most of the hotels have complete calendar of events available. And you can get free information about most anything in New York (e.g., events, hotels, shopping, maps, restaurants, sight-seeing) from the New York Convention and Visitors Bureau, Inc. (90 East 42nd St., across the street from Grand Central Station). Radio and television tickets are available free, on a first come, first serve basis. A new information center, run by the Dept. of Commerce and Public Events, opened last week, is located directly behind the Times Building in Times Square. *Cue* magazine and *The New Yorker* can also be helpful in this respect.

Sight-seeing tour information is available at hotels. The most complete tour, telescoped into the shortest time, is the boat trip around Manhattan Island. But it's touch-and-go as to whether the boats will still be running



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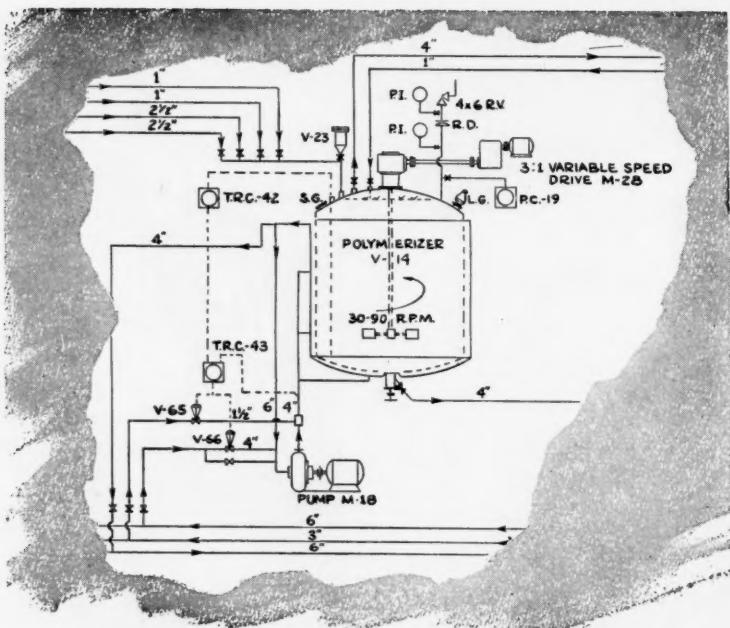


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Maybe you should
look into this

If you make finishing agents based on urea or formaldehyde, your processing costs undoubtedly are affected by the form in which you use these materials. Allied Chemical can supply urea or formaldehyde or U.F. Concentrate-85 — a combination of both in liquid form that may dramatically cut your materials handling and processing costs. Why not look into the Allied story? Write or phone for technical literature on Allied urea, formaldehyde and U.F. Concentrate-85. Or let an Allied technical specialist look over your operations. He may be able to suggest simple modifications that will reduce your resin-making costs.

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a technical discussion of polymer
pilot plant design factors.

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Booth 1000*

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About New York

in December—weather and demand are the factors.

Coinciding Events: If you are interested in attending other events of significance to the chemical industry, keep these four in mind:

- Chemical Exposition Dinner of the New York Section of the American Chemical Society on Monday, Dec. 2 at the Henry Hudson Hotel. Speaker will be Walter G. Whitman, head of MIT's department of chemical engineering; topic: the effect of our atomic energy policy on chemistry and the chemical process industries. Refreshments: 6-7 p.m.; dinner: 7 p.m.; tickets: \$7.50 each.

- 14th Biennial Chemical Engineering Achievement Award Dinner on Tuesday, Dec. 3 at the Waldorf-Astoria honoring 78 organizations for their contributions to the extractive metallurgy of atomic age metals. Zay Jefferies, former vice-president and general manager of the chemical department of General Electric Co., will deliver the keynote address. Walter Whitman will make the presentation. Reception at 7 p.m.; dinner at 8 p.m.; black tie. Tickets: \$25 each, by reservation only.

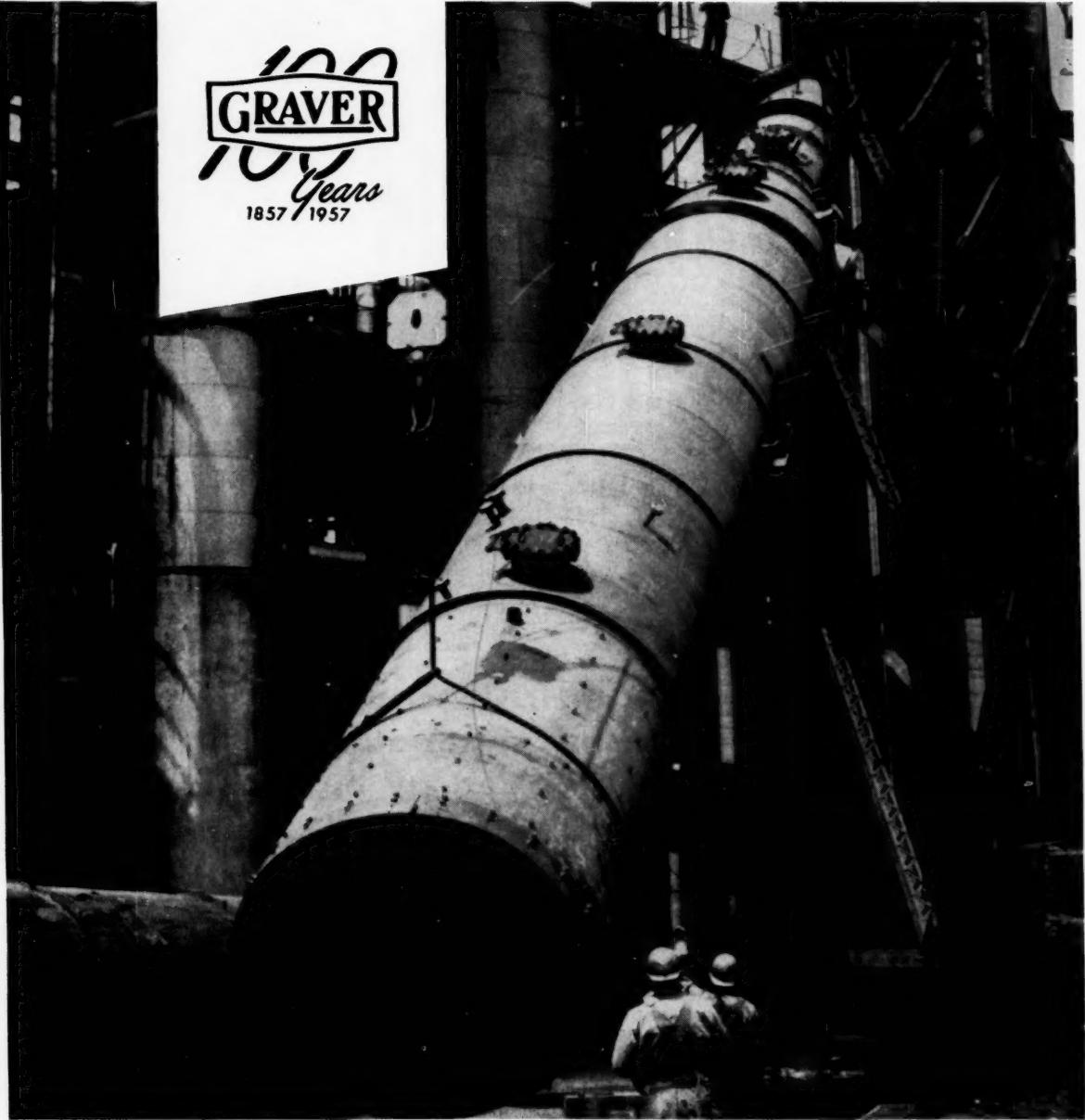
- Annual meeting of the American Society of Mechanical Engineers at the Hotel Statler.

- Annual meeting of the American Rocket Society at the Hotel Statler.

For Dining: New York is noted for its number of restaurants serving quality food. If you can't make a selection from the visitors' bureaus', *Cue's* or *The New Yorker's* lists, "The Complete Guide to New York City" by Andrew Hepburn (American Travel Series, \$1) is a book that includes a good list of 400 restaurants.

And remember, the coliseum has snack bars conveniently located on each floor, a cocktail lounge on the second mezzanine.

Travel Tips: If you are travelling a good distance (20 blocks or more) north or south, the subways are the best bet. Maps are available at some newsstands, visitors bureaus, and are posted in each subway car. Buses are convenient for short hops. It's tough to find public transportation for cross-town trips (buses run across 34th, 42nd, 49th and 50th Sts.). Sometimes it's best to walk, but the east-west blocks are about twice as long as north-south ones. Try to avoid rush-hour travel (7:30-9 a.m., 5-6 p. m.).



BIG GUN IN STAINLESS

to turn the battle against corrosion!

Stainless steel so effectively turns the battle against corrosion that there is no question about the investment payout. To assure long life, Type 304 ELC stainless was selected for this 90' stripper column. Shop-fabricated by Graver in two sections and field-welded into one unit, the column was random-radiographed and tested to pressures of 162 psi. and 246 psi. Graver's expertise in fabricating and welding stainless is always assurance of trouble-free service.



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POTASSIUM BOROHYDRIDE PRICE NEWS!

New low MHI KBH₄ prices expand
borohydride applications
formerly blocked by high costs

Great news! MHI potassium borohydride (KBH₄) is now the lowest priced commercially available borohydride reducing agent. Where high price may have blocked use before, many companies now can profit from KBH₄ for faster, easier, higher yield specific reductions of esters, aldehydes, ketones, acid chlorides and acid anhydrides. New production techniques make these new prices possible.

In addition to price advantage, there are many other factors which make MHI KBH₄ a uniquely versatile and useful reagent. MHI KBH₄ is selective. It goes straight to the heart of a specific reduction without side reactions, without affecting other reducible groups present and without attacking olefinic bonds. A white crystalline solid with a purity of 99% and density of 1.175 g/cc, MHI KBH₄ is stable and can be handled and stored safely in air without loss of purity. You can use it in conventional equipment employing standard techniques.

Solubility is 19.3 grams/100 grams water. Other solvents are water-methanol mixtures, in which solubility ranges from 13.0 grams/100 grams solvent for a ratio of 4 to 1 water-methanol solution down to 0.7 grams/100 grams solvent for methanol alone. MHI KBH₄ also dissolves in other water-alcohol mixtures and liquid ammonia. The solubility in dimethyl formamide is 1.2 grams/100 grams solvent and in dimethyl sulfoxide is 7.5 grams/100 grams solvent at 25°C. In general, solubility sharply decreases with higher alcohols and it is generally insoluble in ethers and

hydrocarbons. It has a negative heat of solution in water of 6.3 Kcal/mol.

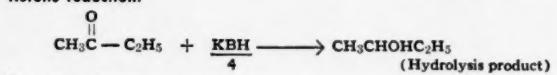
All of these unique advantages, plus the new low price make it a good move for you to use MHI KBH₄ for reactions like these:

TYPICAL ORGANIC REACTIONS:

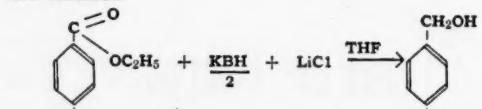
Aldehyde reduction:



Ketone reduction:



Ester reduction:



Acid chloride reduction:



GET THE FACTS ON THESE NEW KBH₄ PRICES!

Call or write for complete information. Technical assistance is also available without obligation.

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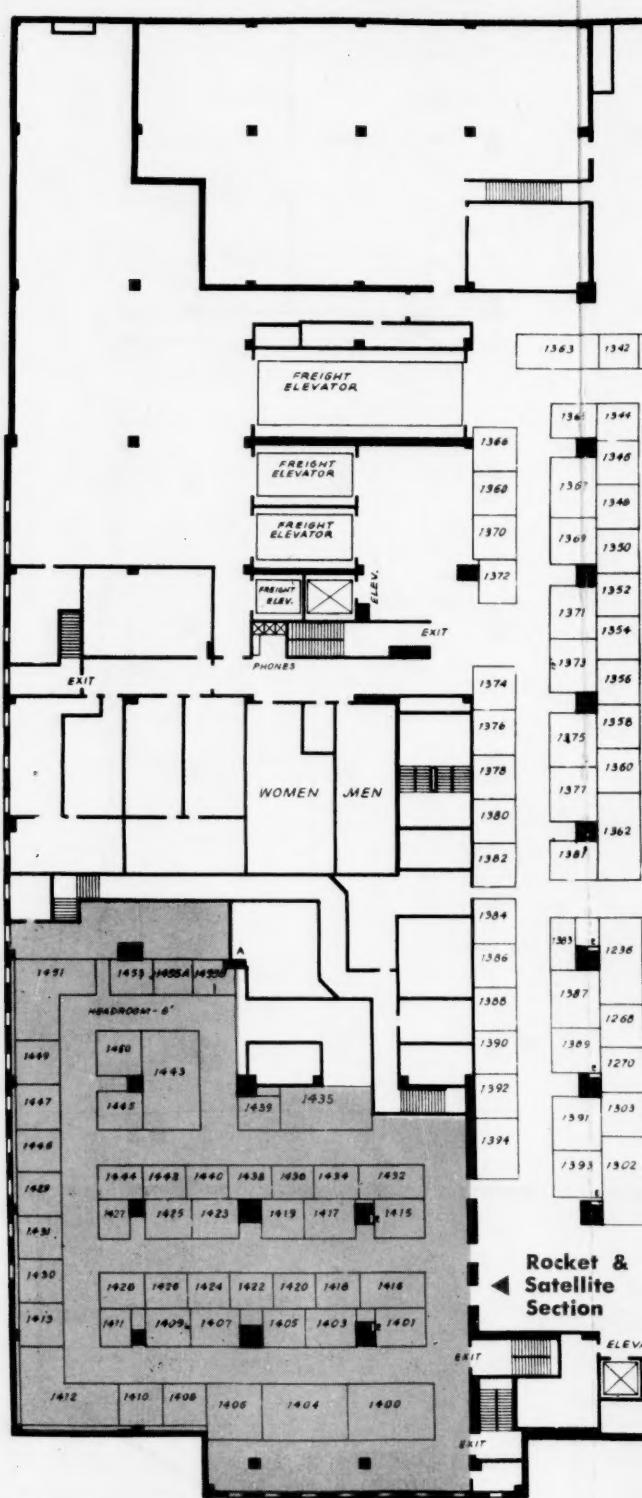
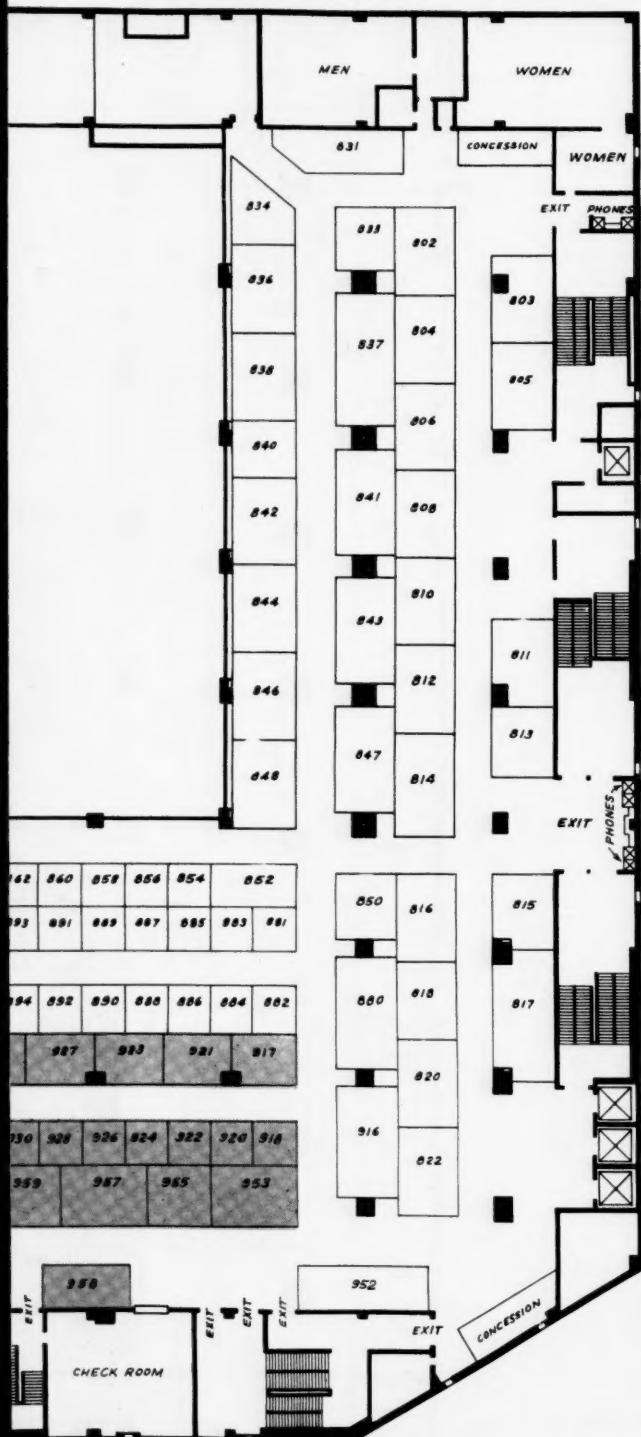
FINAL CHEMSHOW COVERAGE

Where



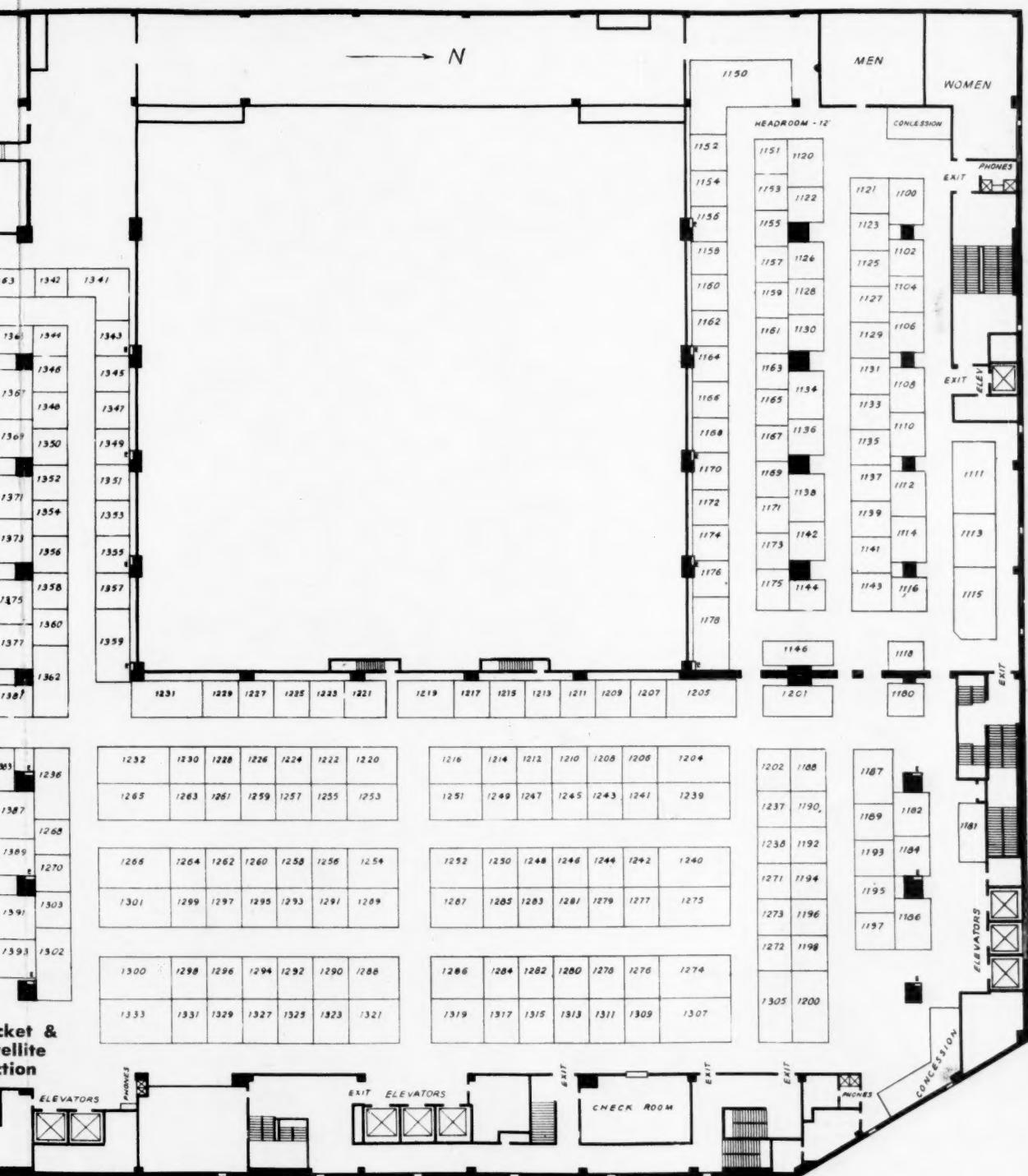
Third Floor

to Find the Exhibitors at the Coll



New York Coliseum

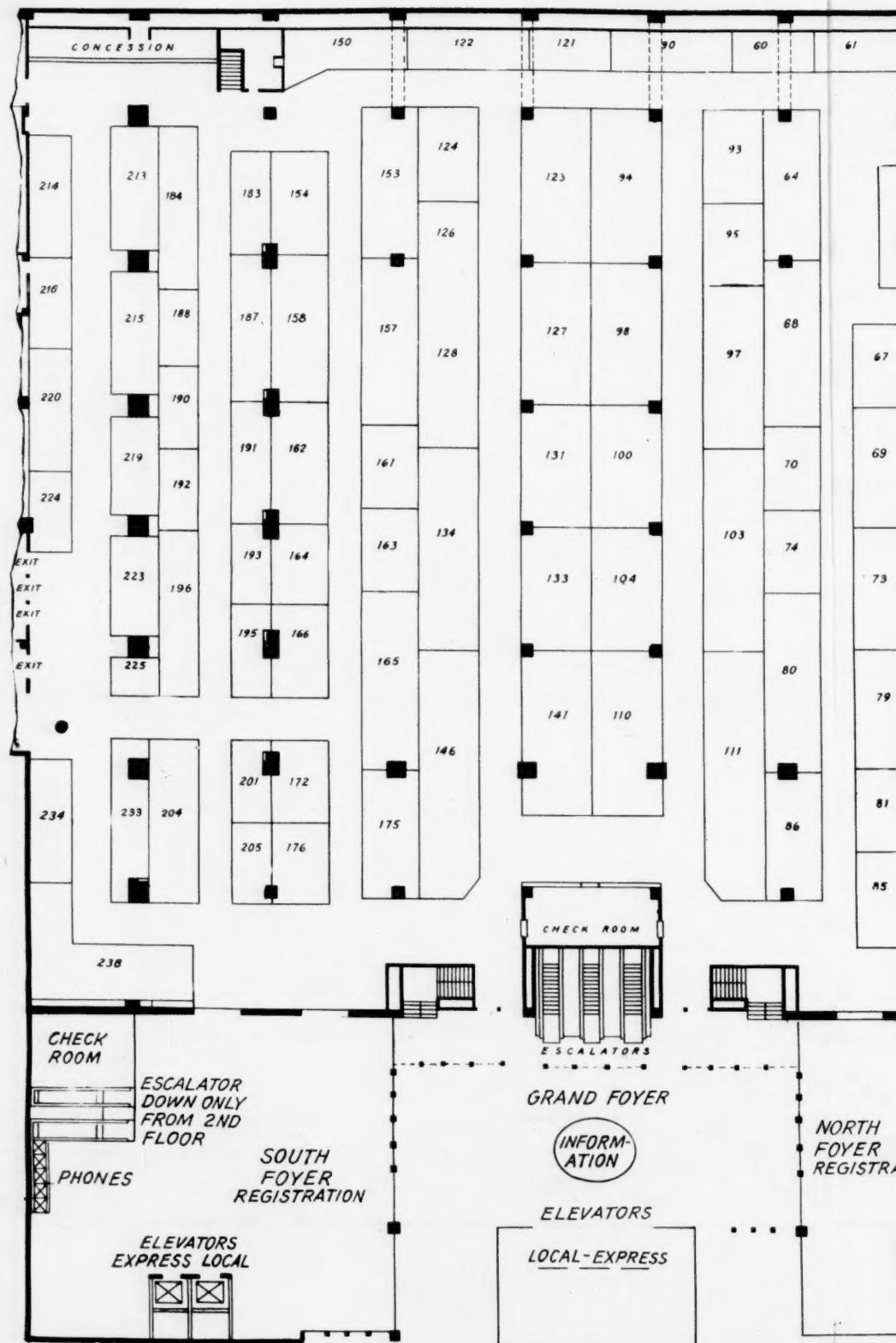
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Fourth Floor

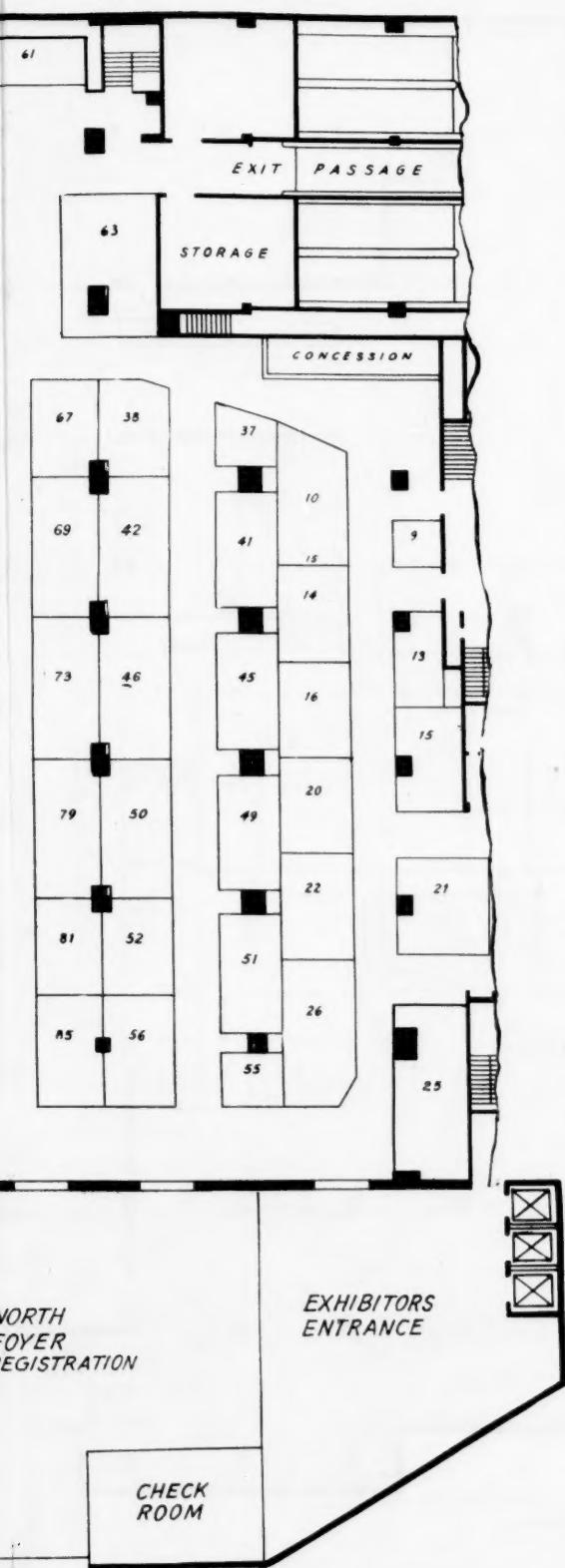
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CHEMSHOW
COVERAGE**

Where to



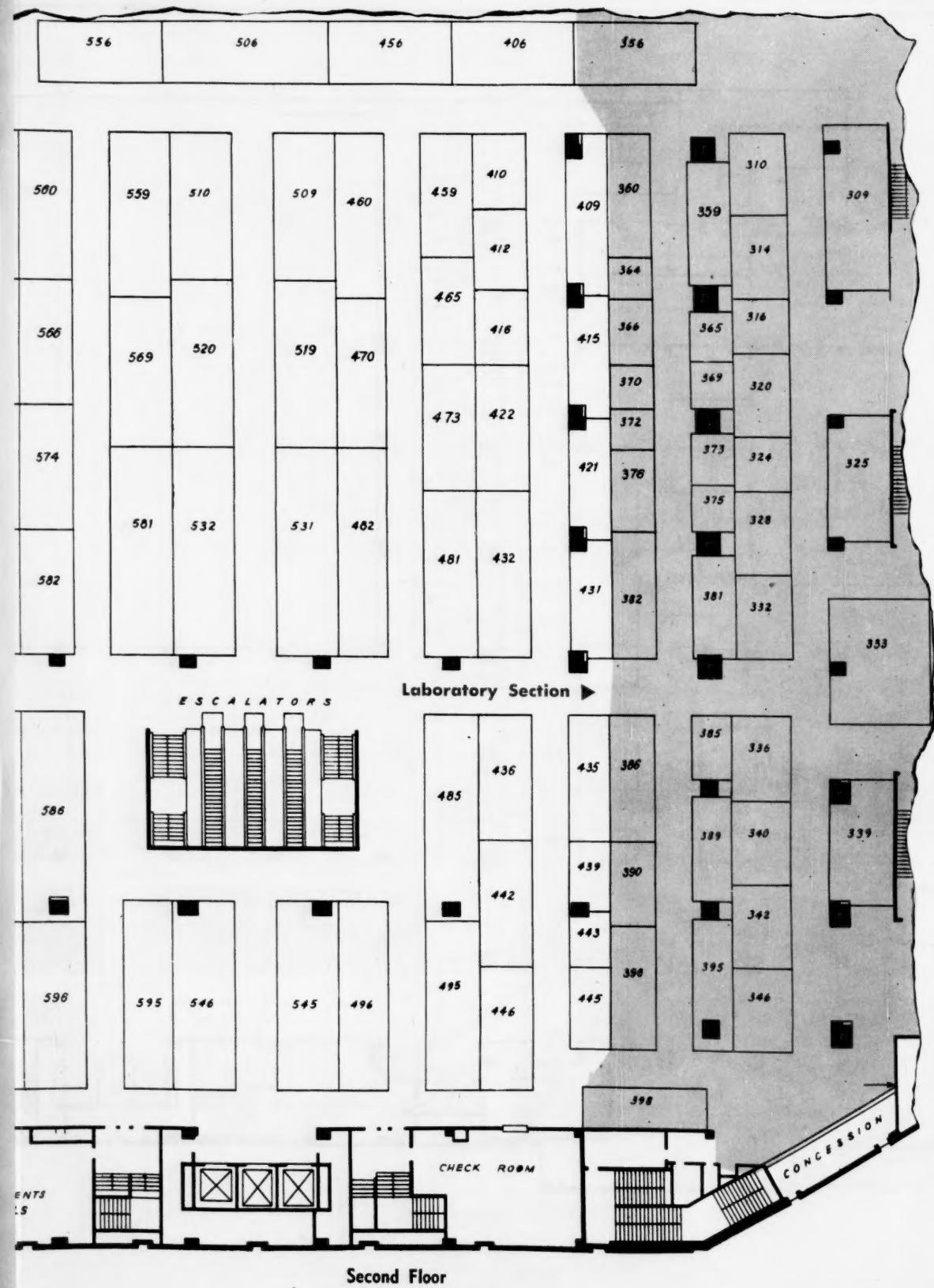
First Floor

To Find the Exhibitors at the Co



New York Coliseum

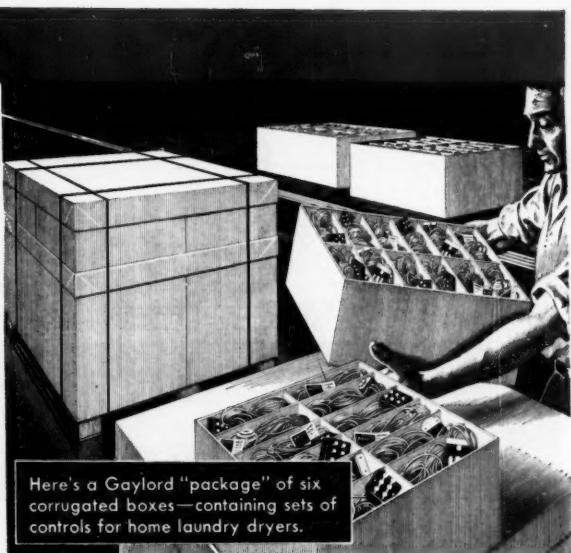
Museum





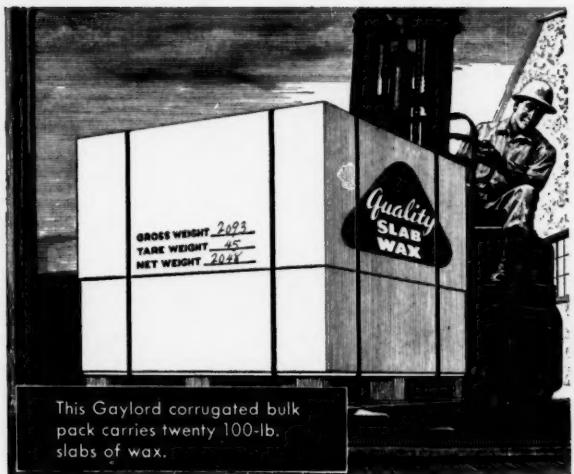
Each of these Gaylord Drumpaks holds 2,000 lbs. of bulk chemicals, replaces twenty 100-lb. units.

... save 20 to 25 manhours per car ...



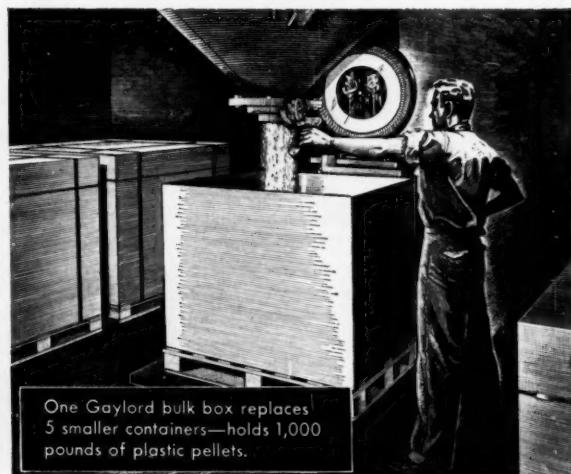
Here's a Gaylord "package" of six corrugated boxes—containing sets of controls for home laundry dryers.

... handling time costs cut 65% ...



This Gaylord corrugated bulk pack carries twenty 100-lb. slabs of wax.

... cuts manhours in weighing and loading ...



One Gaylord bulk box replaces 5 smaller containers—holds 1,000 pounds of plastic pellets.

... save space, save time in palletizing ...

CUT COSTS WITH CORRUGATED BULK PACKS



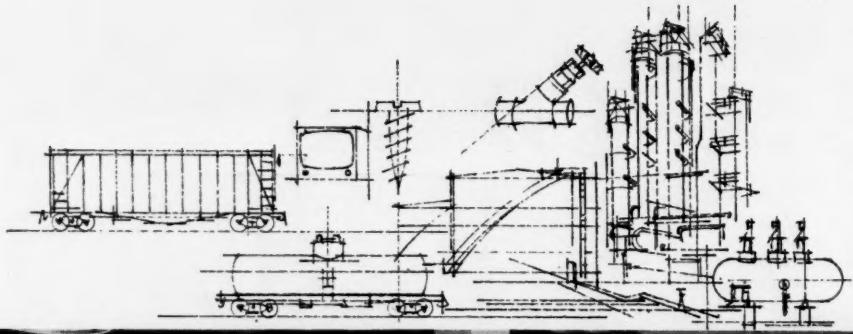
From chemicals to component parts, Gaylord corrugated bulk packs and Drumpaks are saving money, time and handling for shippers. What's your line?

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FINAL CHEMSHOW COVERAGE

CLASSIFIED LIST OF EXHIBITORS

ABRASIVES

Norton Co.	1289-1291
Pangborn Corp.	681
Titanium Alloy Mfg. Div. of National Lead Co.	234
Wheelabrator Corp.	46

ABSORBERS

Carbone Corp., The	803
Chemical & Industrial Corp., The	802
Croll-Reynolds Co., Inc.	1344-1346
Falls Industries, Inc.	131
General American Transportation Corp.	436-442
General Ceramics Corp.	131
Knapp Mills, Andrews-Knapp Construction Co., Inc.	175
Knight, Maurice A.	586
Packed Column Corp.	1018
Peabody Engineering Corp.	979
U.S. Stoneware Co., The	111
West Virginia Pulp and Paper Co., Industrial Chemical Sales Div.	924

ACIDS

Callery Chemical Co.	918-920
Chemical & Industrial Corp., The	802
Dean Thermo-Panel Coil Div., Dean Products, Inc.	184
Fisher Scientific Co.	386
Quaker Oats Co., The, Chemicals Dept.	953
Victor Chemical Works	936-938-940-963
Will Corp. & Subsidiaries, Inc.	395

ACID RESISTING MATERIALS

Allegheny Ludlum Steel Corp.	569
Alloy Steel Products Co.	22
Aluminum Co. of America	546
Amersil Co., Inc.	190-192-196, 225
Ampco Metal, Inc.	412
Carbone Corp., The	803
Crane Packing Co.	908
Duriron Co., Inc., The	520 & 432
DuVerre, Inc.	1049
Ethylene Chemical Corp.	971
Falls Industries, Inc.	131
Fansteel Metallurgical Corp.	617
Filtros, Inc.	854-856
General Alloys Co.	193
General Ceramics Corp.	131
Haynes Stellite Co., Div. of Union Carbide Corp.	460
Havex Corporation Industries, Inc.	546
Heil Process Equipment Corp.	1305
Industrial Plastic Fabricators, Inc.	1217
International Nickel Co., Inc., The	509
Kennametal, Inc.	1116-1137-1139-1141-1143
Klinger, Inc., Richard	1347
Knapp Mills, Andrews-Knapp Construction Co., Inc.	175
Knight, Maurice A.	586
Lancaster Chemical Corp.	922
Lapp Insulator Co., Inc., Process Equipment Div.	696
Lead Industries Assn.	816
Lead Lined Iron Pipe Co.	70
Luzerne Rubber Co., The	435
Mannesmann-Easton Plastic Products Co., Inc.	1115
Metals & Controls Corp., General Plate Div.	1094
Misco Fabricators	1037
Montecatini Society Generale	930-932-934, 961
Nalge Company, Inc., The	1106
Nukem Products Corp.	1072
Okadee Co., The	1386
Pittsburgh Cornning Corp.	1239
Raybestos-Manhattan, Inc.	820
Smith Corp., A. O.	596
Terriss Div., Consolidated Siphon Supply Co., Inc.	1329-1331

Union Steel Corp.	840
United States Gasket Co.	21
United States Steel Corp.	495
U. S. Stoneware Co., The	111
Will Corp. & Subsidiaries, Inc.	395

ADHESIVES

Bemis Bro. Bag Co.	166
Lancaster Chemical Corp.	922
National Rosin Oil Products, Inc.	917
Raybestos-Manhattan, Inc.	820
U. S. Stoneware Co., The	111

AGITATORS

Alsop Engineering Corp.	381
American Well Works, The	1390
Chemineer, Inc.	1220
Colton Co., Arthur, Div. Snyder Tool & Engineering Co.	50
Dorr-Oliver Inc.	531
Eastern Industries, Inc.	1275
Eimco Corp., The	80
Ertel Engineering Corp.	623
Falcon Mfg. Div., The, The First Machinery Corp.	1174-1176
Galigher Co., The	1054
General American Transportation Corp.	436-442
General Ceramics Corp.	131
General Laboratory Supply Co.	310
Girdler Co., The, Votator Div., Div. of National Cylinder Gas Co.	94
Gifford-Wood Co.	219
Gump Co., B. F.	1024-1026
*Hardinge Co., Inc.	582
Hockmeyer & Co., Herman Industrial Products Engineering Co.	1178
Infilco Inc.	1215
International Engineering, Inc.	812
Knapp Mills, Andrews-Knapp Construction Co., Inc.	175
Miller & Son Inc., Franklin P., Supreme Crusher Div.	1010
Mixing Equipment Co.	146
Morehouse-Cowles, Inc.	814
New Brunswick Scientific Co.	324
New England Tank & Tower Co.	79
Patterson Foundry & Machine Co.	154
Pfaudler Co., The, Div. of Pfaudler-Permutit, Inc.	110 & 141
Philadelphia Gear Works, Inc.	164
Precision Scientific Co.	370-372
Pressure Products Industries, Inc.	1180
Read Standard Div. of Capitol Products Corp.	162
Ross & Son Co., Inc., Charles Schutte & Koerting Co.	983
Simco, Inc.	61
Star Tank & Filter Corp.	1281
Terriss Div., Consolidated Siphon Supply Co., Inc.	1329-1331
Troy Engine & Machine Co.	882
Will Corp. & Subsidiaries, Inc.	395

AIR CONDITIONING APPARATUS

Barnebey-Cheney Co.	52
Bryant Mfg. Co.	1089
Colonial Plastics Mfg. Co., The, Industrial Div.	1262-1264
Dean Thermo-Panel Coil Div., Dean Products Inc.	184
Frick Co.	1258-1260
Grinnell Co., Inc.	566
Marlo Coil Co.	1053-1066
Milton Roy Co.	610
Niagara Blower Co.	655
Trerice Co., H. O.	1155-1157
Trinity Equipment Corp.	1392
Voss Co., Inc., J. H. H.	1354-1356
Westinghouse Electric Corp.	510
York Corp., Industrial Div.	893-895-897

ALCOHOL

Fisher Scientific Co.	386
Quaker Oats Co., The, Chemical Dept.	953
Will Corp. & Subsidiaries, Inc.	395

ALKALIES

Fisher Scientific Co.	386
Dean Thermo-Panel Coil Div., Dean Products, Inc.	184

ALLOYS, FERROUS

Allegheny Ludlum Steel Corp.	569
Cooper Alloy Corp.	103
Duriron Co., Inc., The	520 & 532
Engelhard Industries	190-192-196, 225
General Alloys Co.	193
Taylor Forge & Pipe Works	15
Titanium Alloy Mfg. Div., National Lead Co.	234
Union Steel Corp.	840
United States Steel Corp.	495
Wall Colmonoy Corp.	1226-1228
Westinghouse Electric Corp.	510

ALLOYS, NON-FERROUS

Aluminum Co. of America	559
Ampco Metal Inc.	412
Baker & Co., Inc.	190-192-196, 225
Bishop & Co. Platinum Works, J.	900-902
Carborundum Metals Co., The Div. of The Carborundum Co.	1222-1224
Lancaster Chemical Corp.	922
Dow Chemical Co., Magnesium Dept.	1429
Engelhard Industries	190-192-196, 225
Ethylene Chemical Corp.	971
Harper Co., H. M.	1032-1034
Haynes Stellite Co., Div. of Union Carbide Corp.	460
International Nickel Co., Inc., The	509
Kennametal, Inc.	1116, 1137-1139-1141-1143
Lead Industries, Assn.	816
Mallory-Sharon Titanium Corp.	1135
Rem-Cru Titanium, Inc.	1259-1261-1263
Reynolds Metals Co.	1348, 1367, 1369
Taylor Forge & Pipe Works	15
Titanium Alloy Mfg. Div., National Lead Co.	234
Wall Colmonoy Corp.	1226-1228

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Baker & Co., Inc.	190-192-196, 225
Beckman Instruments, Inc.	333
Cambridge Instrument Co., Inc.	376
Gow-Mac Instrument Co.	1246
Laboratory Equipment Corp.	905
Milton Roy Co.	610
Mine Safety Appliances Co.	81
Minneapolis-Honeywell Regulator Co.	635
Perkin-Elmer Corp.	1081-1083
Podbielniak, Inc.	595
Technicon Co., The	316
Will Corp. & Subsidiaries, Inc.	395

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Aluminum Co. of America	559
Bishop & Co., Platinum Works, J.	900-902
Dow Chemical Co., The, Magnesium Dept.	1429
Duriron Co., Inc., The	520, 532
Electrode Div., Great Lakes Carbon Corp.	204

Engelhard Industries	190-192-196, 225
Heil Process Equipment Corp.	1305
Knapp Mills, Andrews-Knapp Construction Co., Inc.	175
Lead Lined Iron Pipe Co.	70
U. S. Stoneware Co., The	111

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Garlock Packing Co., The	415
Klinger, Inc., Richard	1347

AUTOCLAVES

Aetna Scientific Co.	365
Alloy Fabricators Div., Continental Copper & Steel Industries, Inc.	1067
American Sterilizer Co.	366
Artisan Metal Products, Inc.	874
Autoclave Engineers	346
Barnstead Still & Demineralizer Co.	416
Bartlett & Snow Co., The C. O.	686
Baw-Knox Co.	581
Dean Thermo-Panel Coil Div., Dean Products, Inc.	184
Electroweld Mfg. Corp.	1129
Falcon Manufacturing Div., The, of The First Machinery Corp.	1174-1176
Galigner Co., The	1054
High Pressure Equipment Co., The	1272
Knapp Mills, Andrews-Knapp Construction Co., Inc.	175
Koven Fabricators, Inc.	74
North Co., The H. W.	1216
Patterson Foundry & Machine Co., The	154
Precision Scientific Co.	370-372
Pressure Products Industries, Inc.	1180
Standard Scientific Supply Corp.	1131
Star Tank & Filter Corp.	233
Will Corporation & Subsidiaries, Inc.	395

AUTOMATIC TEMPERATURE CONTROL

Barber-Colman Co., Wheelco Instrument Div.	1734
Bailey Meter Co.	45
Bragar Co., Inc., Norman	1349-1351
Brinkmann & Co., Inc., C. A.	360
Burling Instrument Co.	9
Fischer & Porter Co.	496, 545
Fisher Scientific Co.	386
Foster Engineering Co.	947
Foxboro Co., The	519
Leslie Co.	1333
Minneapolis-Honeywell Regulator Co., Industrial Div.	635
Precision Scientific Co.	370-372
Ramo-Woolridge Corp.	1068
Research Controls	1186
Robertshaw-Fulton Controls Co., Instrument Div.	1366-1368
Sarco Co., Inc.	163
Scientific Development Co.	382
Scientific Glass Apparatus Co., Inc.	332
Taylor Instrument Co.	104
Thermo-Electric Co., Inc.	1111
Trerice Co., H. O.	1155-1157
Wiegand Co., Edwin L.	850
Will Corp. & Subsidiaries, Inc.	395

BAGS

Bel-Art Products	1098
Bemis Bro. Bag Co.	166

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Brinkmann & Co., Inc., C. A.	360
Exact Weight Scale Co.	1371-1373
Fisher Scientific Co.	386
General Laboratory Supply Co.	310
Mettler Instrument Corp.	339
New York Laboratory Supply Co., Inc.	1022
Scientific Glass Apparatus Co., Inc.	332
Standard Scientific Supply Corp.	1131

Thayer Scale Corp.	1350-1352
Torsion Balance Co., The	328
Welch Mfg. Co., W. M.	205
Will Corp. & Subsidiaries, Inc.	395

BARRELS, DRUMS AND KEGS

Associated Cooperage Industries of America, Inc., The	898
Bel-Art Products	1098
Bennett Industries, Inc.	1393
Continental Can Co., Inc., Robert Gair Paper Products Group, Fibre Drum & Corrugated Box Div.	899-901-903
Dean Thermo-Panel Coil Div., Dean Products Inc.	184
Delaware Barrel & Drum Co., Inc.	1187-1189-1193
Du Verre, Inc.	1049
Grief Bros. Cooperage Corp., The	41
Pressed Steel Tank Co.	631
Reynolds Metals Co.	1348-1367-1369
Rheem Mfg. Co.	808-810
United States Steel Corp.	495

BASKETS, DIPPING

Bel-Art Products	1098
Buffalo Wire Works Co.	1376
General Ceramics Corp.	131
Industrial Plastic Fabricators, Inc.	1217
Industrial Products Engineering Co.	1215
Luzerne Rubber Co., The	435
Misco Fabricators	1037
Multi-Metal Wire Cloth Co., Inc.	191
Newark Wire Cloth Co.	183
Tyler Co., The W. S.	574
U. S. Stoneware Co., The	111

BEARINGS

Bartlett & Snow Co., The C. O.	686
Dore Co., John L.	1295-1297
Ethylene Chemical Corp.	971
Great Western Mfg. Co.	216
Haynes Stellite Co., Div. of Union Carbide Corp.	460
Link Belt Co.	165
Stephens-Adamson Mfg. Co.	1039
United States Gasket Co.	21
Westinghouse Electric Corp.	510

BELTS

Chain Belt Co.	1028
Great Western Mfg. Co.	216
Mine Safety Appliances Co.	81
Raybestos-Manhattan, Inc.	820

BLAST EQUIPMENT—SAND

Norton Co.	1289-1291
Pangborn Corp.	681
Sly Mfg. Co., The W. W.	73
Wheelabrator Corp.	46

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Alloy Fabricators Div., Continental Copper & Steel Industries, Inc.	1067
Blaw-Knox Co.	581
Blickman, Inc., S.	325
Colton Co., Arthur, Div. Snyder Tool & Engineering Co.	50
Day Co., The J. H., Div., The Cleveland Automatic Machine Co.	121, 122
Fitzpatrick Co., Inc., The J.	49
Gump Co., B. F.	1024-1026
Patterson Foundry & Machine Co., The	154
Patterson-Kelly Co., Inc., The	188
Read Standard, Div. of Capitol Products Corp.	215
Ross & Sons Co., Inc., Charles	983
Sprout, Waldron & Co., Inc.	844-846-848
Stokes Corp., F. J.	38, 67
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Syntron Co.	93

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Allis-Chalmers Mfg. Co.	636
Day Co., The	13
Du Verre, Inc.	1049
Fluor Products Co.	1036
Fuller Co.	446
General American Transportation Corp.	436-442
Havex Industries, Inc.	546
Industrial Plastic Fabricators, Inc.	1217
Ingersoll-Rand Co.	128
International Engineering, Inc.	812
Niagara Blower Co.	655
Schutte & Koerting Co.	61
Smico, Inc.	1281
Sprout, Waldron & Co., Ind.	844-846-848

BOILERS

International Boiler Works Co., The	1216
Vogt Machine Co., Henry	124
Yuba Consolidated Industries, Inc.	858-860

BOILER COVERING AND INSULATION

Pittsburgh Corning Corp.	1239
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BOLTING CLOTH

Buffalo Wire Works Co.	1376
Great Western Mfg. Co.	216
Multi-Metal Wire Cloth Co., Inc.	191
Newark Wire Cloth Co.	183
Smico, Inc.	1281
Sprout, Waldron & Co., Inc.	844-846-848
Tyler Co., The W. S.	574

BOTTLING MACHINERY

Cherry-Burrell Corp.	984
Ertel Engineering Corp.	623
Inflico Inc.	1163
Popper & Sons, Inc.	804
Terriss Div., Consolidated Siphon Supply Co., Inc.	1329-1331
Dean Thermo-Panel Coil Div., Dean Products, Inc.	184

BRICK—ACID PROOF

Amersil Co., Inc.	190-192-196, 225
General Ceramics Corp.	131
Harbison-Walker Refractories Co.	1241-1243
Heil Process Equipment Corp.	1305
Knight, Maurice A.	586
National Carbon Co., Div. of Union Carbide Corp.	460
Nukem Products Corp.	1072
Patterson Foundry & Machine Co., The	154
U. S. Stoneware Co., The	111

BRICK—INSULATING

Amersil Co., Inc.	190-192-196, 225
Harbison-Walker Refractories Co.	1241-1243
Norton Co.	1291-1289
Pittsburgh Corning Corp.	1239
Titanium Alloy Mfg. Div. National Lead Co.	234

BRICK—REFRACTORY

Amersil Co., Inc.	190-192-196, 225
Harbison-Walker Refractories Co.	1241-1243
National Carbon Co., Div. of Union Carbide Corp.	460
Norton Co.	1291-1289
Titanium Alloy Mfg. Div. National Lead Co.	234

BRIQUETTING AND TABLET MAKING MACHINERY

California Pellet Mill Co.	1358-1360
Carver, Inc., Fred S.	90
Colton Co., Arthur Div. Snyder Tool & Engineering Co.	50
Fitzpatrick Corp.	1095
Miller & Son, Inc., Franklin P.	1010
Stokes Corp., F. J.	38, 67

BUCKETS, ELEVATOR

American Well Works, The	1390
Bartlett & Snow Co., The C. O.	686
Bucket Elevator Co., The	1040
Great Western Mfg. Co.	216
Industrial Products Engineering Co.	1215
Jeffrey Mfg. Co., The	97
Link Belt Co.	165
Read Standard Div., Capitol Products Corp.	162
Renneburg & Sons Co., Edw.	1078
Smico, Inc.	1281
Sprout, Waldron & Co., Inc.	844-846-848
Stephens-Adamson Mfg. Co.	1039

BUILDING MATERIALS

Lead Industries Assn.	816
National Rosin Oil Products, Inc.	917
Pittsburgh Corning Corp.	1239
Reynolds Metals Co.	1348, 1367, 1369

BURNERS

American Gas Furnace Co.	833
Atlantic Research Corp.	1424-1426
Bryant Mfg. Co.	1089
Carlisle Gas Burners	1255
Fisher Scientific Co.	386
New York Laboratory Supply Co., Inc.	1022
Peabody Engineering Corp.	979
Precision Scientific Co.	370-372
Renneburg & Sons Co., Edw.	1078
Schutte & Koerting Co.	61
Selas Corp. of America	973-975
Southwestern Engineering Co.	1250-1252
Welch Mfg. Co., W. M.	205
Will Corp. & Subsidiaries, Inc.	395

CABINETS—FILING, CHEMICAL, LABORATORY

Brown-Morse Co.	1156
Fisher Scientific Co.	386
Hamilton Mfg. Co.	359
Keweenaw Mfg. Co.	398
Laboratory Furniture Co., Inc.	309
Lennard Co., P. M.	1227
Metalab Equipment Co., Div. of Norbute Corp.	356
Protectoseal Co., The	1286
Will Corp. & Subsidiaries, Inc.	395

CALCINERS

American Gas Furnace Co.	833
Amersil Co., Inc.	190-192-196, 225
Bartlett & Snow Co., The C. O.	686
Davenport Machine & Foundry Co.	818
Dorr-Oliver, Inc.	531
General American Transportation Corp.	436-442
Nichols Engineering & Research Corp.	624
Standard Steel Corp.	153

CALORIMETERS

Fisher Scientific Co.	386
Precision Scientific Co.	370-372
Scientific Glass Apparatus Co., Inc.	332
Welch Mfg. Co., W. M.	205
Will Corp. & Subsidiaries, Inc.	395

CANS

Dean Thermo-Panel Coil Div., Dean Products, Inc.	184
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Protectoseal Co., The	1286
Terriss Div., Consolidated Siphon Supply Co., Inc.	1329-1331

CARBON

Barnebey-Cheney Co.	52
Electrode Div., Great Lakes Carbon Co.	204
Heil Process Equipment Corp.	1305
National Carbon Co., Div. of Union Carbide Corp.	460
West Virginia Pulp & Paper Co., Industrial Chemical Sales Div.	924

CARBOY TILTTERS

Fisher Scientific Co.	386
Industrial Products Engineering Co.	1215
Will Corp. & Subsidiaries, Inc.	395

CARS, TANK

Automotive Rubber Co., Inc.	1134-1136
Bishopric Products Co., The	1378
Dean Thermo Panel Coil Div., Dean Products, Inc.	184
General American Transportation Corp.	436-442
Knapp Mills, Andrews-Knapp Construction Co., Inc.	175

CASTINGS

Allegheny Ludlum Steel Corp.	569
Ampco Metal, Inc.	412
Arwood Precision Casting Corp.	1417
Duriron Co., Inc., The	520, 532
Dow Chemical Co., The, Magnesium Dept.	1429
Fischer & Porter Co.	496 & 545
General Alloys Co.	193
Hardinge Co., Inc.	582
Haynes Stellite Co., Div. of Union Carbide Corp.	460
International Nickel Co., Inc., The	509
Lead Industries Association	816
Lebanon Steel Foundry	20
Wall Colmonoy Corp.	1226-1228

CATALYSTS

Aluminum Co. of America	559
Baker & Co., Inc.	190-192-196, 225
Barnebey-Cheney Co.	52
Bishop & Company, Platinum Works, J.	900-902
Callery Chemical Co.	918-920
Catalytic Combustion Corp.	1165
Engelhard Industries	190-192-196, 225
Filtros, Inc.	854-856
Girdler Co., The, Catalyst Dept., Div. of The National Cylinder Gas Co.	94
Hanovia Chemical & Mfg. Co.	190-192-196-225
Patterson Foundry & Machine Co., The	154
Victor Chemical Works	936-938-940-963

CAUSTIC POTS

Bell-Art Products	1098
Blaw-Knox Co.	581
Misco Fabricators	1037

CELLULOSE

Brown Co.	923
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CEMENT

Aluminum Co. of America	559
Colonial Plastics Mfg. Co., The, Industrial Div.	1262-1264
Filtros, Inc.	854-856
Havex Industries, Inc.	546
Heil Process Equipment Corp.	1305
Knight Co., Maurice A.	586
National Rosin Oil Products, Inc.	917
Norton Co.	1289-1291
Nukem Products Corp.	1072

Patterson Foundry & Machine Co., The	154
United States Stoneware Co., The	111

CENTRIFUGALS

Alsop Engineering Corp.	381
American Machine & Metals, Inc.	456, 506, 556
American Tool & Machine Co.	862
Baker-Perkins, Inc., Chemical Machinery Div.	560 & 609
Centrico, Inc.	842
Cherry-Burrell Corp.	984
Cornell Machine Company, The	1110
DeLaval Separator Co., The	1211-1213
Door-Oliver Inc.	531
Entelete Div., Safety Industries, Inc.	645
Fisher Scientific Co.	386
Fletcher Works, Inc.	459
General Laboratory Supply Co.	310
Pfaudler Co., The, Div. of Pfaudler Permutit, Inc.	110, 141
Podbielnik, Inc.	595
Precision Scientific Co.	370-372
Scientific Glass Apparatus Co., Inc.	332
Sharples Corp., The	485
Smico, Inc.	1281
Sorvall, Inc., Ivan	1085
Tolhurst Centrifugals Div., American Machine & Metals, Inc.	506
York Corp., Industrial Div.	893-895-897

CERAMICS

Carrier Conveyor Corp.	1321-1323-1325-1327
Filtros, Inc.	854-856
General Ceramics Corp.	131
Knight Co., Maurice A.	586
Laboratory Equipment Corp.	905
Lapp Insulator Co., Inc., Process Equipment Div.	696
Lead Industries Assn.	816
Norton Co.	1289-1291
Patterson Foundry & Machine Co., The	154
Reynolds Metals Co.	1348, 1367-1369
Synthetic Mica Corp., Subsidiary of Mycalex Corp. of America	948
Titanium Alloy Mfg. Div. National Lead Co.	234
United States Stoneware Co., The	111

CHEMICAL PLANT EQUIPMENT

Allis-Chalmers Mfg. Co.	636
Alloy Fabricators Div., Continental Copper & Steel Industries, Inc.	1067
Alloy Steel Products Co.	22
American Tool & Machine Co.	862
American Well Works, The	1390
Amersil Co., Inc.	190-192-196, 225
Ampco Metal, Inc.	412
Anderson Co., The V. D. Div.	1265
International Basic Economy Corp.	1265
Artisan Metal Products, Inc.	874
B.I.F. Industries, Inc.	660
Barnstead Still & Demineralizer Co.	416
Baker-Perkins, Inc., Chemical Machinery Div.	560 & 609
Bart Manufacturing Corp.	1341
Bartlett & Snow Co., The C. O.	686
Beckman Instruments, Inc.	333
Blaw-Knox Co.	581
Blickman, Inc., S.	325
Bowen Engineering, Inc.	706
Brabender Instruments, Inc., C. W.	342
Bucket Elevator Co., The	1040
Bryant Manufacturing Co.	1089
Carbone Corp., The	803
Carborundum Metals Co., The, Div. of The Carborundum Co.	1222-1224
Carrier Conveyor Corp.	1321-1323-1325-1327
Carver, Inc., Fred S.	90
Chemical & Industrial Corp., The	802
Chemicollod Laboratories, Inc.	618
Cheminique Co.	1070
Cherry-Burrell Corp.	984
Colton Co., Arthur, Div. Snyder Tool & Engineering Co.	50
Continental-Emsco Co.	1236
Continental Mfg. Co.	1050
Cooper Alloy Corp.	103
Cornell Machine Co., The	1110
Corning Glass Works	134

Crane Co.	422
Davenport Machine & Foundry Co.	818
Day Co., The J. H. Div., The Cleveland Automatic Machine Co.	121-122
DeLaval Separator Co., The	1211-1213
Derrick Manufacturing Co.	1076
Dorr-Oliver, Inc.	531
Dowington Iron Works, Div. of Pressed Steel Tank Co.	631
Dravo Corp.	1150
Du Pont de Nemours & Co., Inc., E. I., Polymers Dept.	950
Du Verre, Inc.	1049
Eimco Corp., The	80
Electroweld Mfg. Corp.	1129
Entelet Div., Safety Industries, Inc.	645
Ertel Engineering Corp.	623
Ethylene Chemical Corp.	971
Falls Industries, Inc.	131
Falcon Mfg. Div., The, of The First Machinery Corp.	1174-1176
Fansteel Metallurgical Corp.	617
Fibercast Corp., The	1391
Filtros, Inc.	854-856
Fitzpatrick Corp.	1095
Fitzpatrick Co., Inc., The W. J.	49
Fluid Energy Processing & Equipment Co.	997
General Ceramics Corp.	131
General American Transportation Corp.	436-444
Gifford-Wood Co.	219
Girdler Co., The, Votator Div., A Div. of National Cylinder Gas Company	94
Great Western Mfg. Co.	216
Hamilton Kettles Div., Brighton Corp.	1341
Hapman Conveyors, Inc., Div. of Hapman-Dutton Co.	1345
Havex Industries, Inc.	546
Haynes Stellite Co., Div. of Union Carbide Corp.	460
Heil Process Equipment Corp.	1305
High Pressure Equipment Co., Inc.	1272
Hockmeyer & Co., Herman	1178
Howe Scale Co., The, Subsidiary of Safety Industries Inc.	645
Hunt Machine Co., Rodney	1240-1242-1244
Industrial Plastic Fabricators, Inc.	1217
Industrial Products Engineering Co.	1215
International Engineering Inc.	812
Jacoby-Tarbox Corp.	1362
Jeffrey Mfg. Co., The	97
Knapp Mills, Andrews-Knapp Construction Co., Inc.	175
Knight Co., Maurice A.	586
Koven Fabricators, Inc.	74
Lapp Insulator Co., Inc., Process Equipment Div.	696
Lawrence Pumps, Inc.	852
Lead Industries Assn.	816
Lead Lined Iron Pipe Co.	70
Lehmann Co., Inc., J. M.	1205
Lennard Co., Inc., P. M.	1227
Leslie Co.	1333
Link-Belt Co.	165
Luzerne Rubber Co., The	435
McIntosh Equipment Corp.	1341-1343
Mannesmann-Easton Plastic Products Co., Inc.	1115
Marman Division, Aeroquip Corp.	1419
Metal Glass Products Co.	623
Metabat Equipment Co., Div. of Norbut Corp.	356
Miller & Son, Inc., Franklin P. Supreme Crusher Div.	1010
Misco Fabricators	1037
Mixing Equipment Co., Inc.	146
National Instrument Co.	1070
New England Tank & Tower Co.	79
Nichols Engineering & Research Corp.	624
Norcross, Sterling E., Kem Feed Div.	1372
North Co., The H. W.	1216
Okadee Co., The	1386
Packed Column Corp.	1018
Parks-Cramer Co.	55
Patterson Foundry & Machine Co., The	154
Peabody Engineering Corp.	979
Pennsylvania Fluorocarbon Co., Inc.	969
Perkin-Elmer Corp., The	1081-1083
Pfaudler Co., The, Div. of Pfaudler Permutit, Inc.	110, 141
Podbieliak, Inc.	595
Prater Pulverizer Co.	904-906
Pressed Steel Tank Co.	631
Proctor & Schwartz, Inc.	684
Protectoseal Co., The	1286
Pulva Corp.	220

Potter & Rayfield, Inc.	1341
Ramo-Woolridge Corp., The	1068
Read Standard Div., Capitol Products Corp.	162
Rem-Cru Titanium, Inc.	1259-1261-1263
Renneburg & Sons Co., Inc., Edw.	1078
Rietz Mfg. Co.	1231
Ross & Son Co., Inc., Charles	983
Sargent's Sons Corp., C. G.	1375-1377
Schutte & Koertting Co.	61
Schutz-O'Neill Co.	838
Scientific Development Co.	382
Smico, Inc.	1281
Smith Corp., A. O.	596
Southwestern Engineering Co.	1250-1252
Sperry & Co., D. R.	1362
Sprout, Waldron & Co., Inc.	844-846-848
Standard Steel Corp.	153
Star Tank & Filter Corp.	233
Stephens-Adamson Mfg. Co.	1039
Stokes Corp., F. J.	38 & 67
Straight Line Filters, Inc.	1370
Strong-Scott Mfg. Co., The	1138-1142-1144
Sturtevant Mill Co.	421
Superior Electric Co., The	811
Swenson Evaporator Co., Div. of Whiting Corp.	85
Syntron Co.	93
Taylor Forge & Pipe Works	15
Taylor Instrument Cos.	104
Terriss Div., Consolidated Siphon Supply Co., Inc.	1329-1331
Tri-Homo Corp.	214
United States Steel Corp.	495
United States Stoneware Co., The	111
Vac-U-Max	1342
Vanton Pump & Equipment Corp.	103
Vogt Machine Co., Henry	124
Voss, Inc., J. H. H.	1354-1356
Wall Colmonoy Corp.	1226-1228
Wallace & Tiernan, Inc.	445
Warren Pumps, Inc.	1277-1279
Westinghouse Electric Corp.	510
Will Corp. & Subsidiaries, Inc.	395
Young Radiator Co.	1160-1162
Thayer Scale Corp.	1350-1352
Yuba Consolidated Industries, Inc.	858-860

West Virginia Pulp & Paper Co., Industrial Chemical Sales Div.	926
Victor Chemical Works.	936-938-940-963
West Virginia Pulp & Paper Co., Industrial Chemical Sales Div.	924

CHEMICALS, LABORATORY

Allied Chemical & Dye Corp., Divisions: Barrett, General Chemical, National Aniline, Nitrogen, Semet-Solvay, Solvay Process, International	955-957-959, 1439
Ansul Chemical Co.	95
Bishop & Co. Platinum Works, J.	900-902
Callery Chemical Co.	918-920
Dean Thermo-Panel Coil Div., Dean Products, Inc.	184
Fisher Scientific Co.	386
General Laboratory Supply Co.	310
Johns-Manville Sales Corp.	172-176
Knapp Mills, Andrews Knapp Construction Co., Inc.	175
Metal Hydrides Inc.	944
New York Laboratory Supply Co., Inc.	1022
Scientific Glass Apparatus Co.	332
Standard Scientific Supply Corp.	1131
Titanium Alloy Mfg. Division, National Lead Co.	234
Welch Mfg. Co., W. M.	205
Will Corp. & Subsidiaries, Inc.	395

CHEMICALS, PHARMACEUTICAL

Allied Chemical & Dye Corp., Div.: Barrett, General Chemical, National Aniline, Nitrogen, Semet-Solvay, Solvay Process, International	955-957-959, 1439
Ansul Chemical Co.	95
Callery Chemical Co.	918-920
Chemo-Puro Mfg. Corp.	962
Dean Thermo-Panel Coil Div., Dean Products, Inc.	184
Johns-Manville Sales Corp.	172-176
Metal Hydrides Inc.	944
Michigan Chemical Corp.	942
Victor Chemical Works	936-938-940-963

CHEMISTS

Atlantic Research Corp.	1424-1426
Fisher Scientific Co.	836
Sadtler Research Laboratories	1303

CHLORINATORS

B.I.F. Industries, Inc.	660
Electroweld Mfg. Corp.	1129
Fischer & Porter Co.	496 & 545
General American Transportation Corp.	436-442
Knapp Mills, Andrews-Knapp Construction Co., Inc.	175
Lapp Insulator Co., Inc., Process Equipment Div.	696
Norcross Cos., Sterling E., Kem-Feed Div.	1372
Precision Chemical Pump Corp.	1198
Standard Steel Corp.	153
Terriss Div., Consolidated Siphon Supply Co., Inc.	1329-1331
Wallace & Tiernan, Inc.	445

CLARIFIERS

Alsop Engineering Corp.	381
American Tool & Machine Co.	862
Bird Machine Co.	685
Carver, Inc., Fred S.	90
Centrico, Inc.	842
Chain Belt Co.	1028
Cherry-Burrell Corp.	984
Dorr-Oliver, Inc.	531
Eimco Corp., The	80
Hardinge Co., Inc.	582
Hungerford & Terry, Inc.	1200
Illinois Water Treatment Co.	888
Inflico Inc.	1163
North Co., The H. W.	1216
Podbieliak, Inc.	595

Sharples Corp., The	485
Shriver & Co., Inc., T.	473
Terris Div., Consolidated Siphon Supply Co., Inc.	1329-1331

CLASSIFIERS

Bird Machine Co.	685
Derrick Mfg. Co.	1076
Dorr-Oliver, Inc.	531
Electroweld Mfg. Corp.	1129
Exact Weight Scale Co.	1371-1373
Fluid Energy Processing & Equipment Co.	997
Fluor Products Co.	1036
Hardinge Co., Inc.	582
International Engineering, Inc.	812
Nichols Engineering & Research Corp.	624
Sharples Corp., The	485
Smico, Inc.	1281
Southwestern Engineering Co.	1250-1252
Sturtevant Mill Co.	421
Toledo Scale Co.	157

CLUTCHES

Link Belt Co.	165
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COAL TAR OILS

Missouri Coke & Chemical Div., Great Lakes Carbon Corp.	204
Dean Thermo-Panel Coil Div., Dean Products, Inc.	184

COATINGS, PROTECTIVE

Automotive Rubber Co., Inc.	1134-1136
Bishipric Products Co., The	1378
Gaigher Co., The	1054
General American Transportation Corp.	436-442
General Dispersions, Inc.	967
General Plastics Corp.	967
Havex Industries, Inc.	546
Heil Process Equipment Corp.	1305
Knight Co., Maurice A.	586
Lancaster Chemical Corp.	922
Lead Industries Assn.	816
Lead Lined Iron Pipe Co.	70
Luzerne Rubber Co., The	435
Norton Co.	1289-1291
Nukem Products Corp.	1072
Raybestos-Manhattan, Inc.	820
Tall Oil Division, Pulp Chemicals Assn.	933
Titanium Alloy Mfg. Div., National Lead Co.	234
United States Gasket Co.	21
United States Stoneware Co., The	111

COILS

Artisan Metal Products, Inc.	874
Dean Thermo-Panel Coil Div., Dean Products, Inc.	184
Frick Co.	1258-1260
General Ceramics Corp.	131
Haynes Stellite Co., Div. of Union Carbide Corp.	460
Heil Process Equipment Corp.	1305
Knapp Mills, Andrews-Knapp Construction Co., Inc.	175
Lead Industries Assn.	816
Lead Lined Iron Pipe Co.	70
Platecoil Div., Tranter Mfg. Inc.	1206, 1208, 1210
Terris Div., Consolidated Siphon Supply Co., Inc.	1329-1331

COKE OVEN MACHINERY

Electroweld Mfg. Corp.	1129
Link-Belt Co.	165

COLLECTORS

American Air Filter Co., Inc.	676
B.I.F. Industries, Inc.	660
Bartlett & Snow Co., The C. O.	686

Day Co., The	13
Dracco Corp.	987-989
Ducon Co., Inc., The	1033
Fluid Energy Processing & Equipment Co.	997
Inflo Inc.	1163
Industrial Products Engineering Co.	1215
Pangborn Corp.	681
Peabody Engineering Corp.	979
Pulverizing Machinery Div., Metals Disintegrating Co.	632
Schutz-O'Neill Co.	838
Sly Mfg. Co., The W. W.	73
Sprout, Waldron & Co., Inc.	844-846-848
Technicon Co., The	316
Vac-U-Max	1342
Wheelabrator Corp.	46

COLLOID MILLS

Chemical Colloid Laboratories, Inc.	618
Fitzpatrick Co., Inc., The W. J.	49
Gifford-Wood Co.	219
Industrial Products Engineering Co.	1215
Lancaster Chemical Corp.	922
Manton-Gaulin Mfg. Co., Inc.	51
Morehouse-Cowles, Inc.	814
Pfaudler Co., The Pfaudler-Permitit, Inc. Div.	141
Smico, Inc.	1281
Tri-Homo Corp.	214
Troy Engine & Machine Co.	882
Will Corporation & Subsidiaries, Inc.	395

COLORIMETERS

Beckman Instruments, Inc.	333
Coleman Instruments Inc.	320
Fisher Scientific Co.	386
New York Laboratory Supply Co., Inc.	1022
Perkin-Elmer Corp., The	1081-1083
Photovolt Corp.	389
Scientific Glass Apparatus Co., Inc.	332
Technicon Co., The	316
Will Corporation & Subsidiaries, Inc.	395

COMPARATORS

Fischer & Porter Co.	496 & 545
Fisher Scientific Co.	386
New York Laboratory Supply Co., Inc.	1022
Wallace & Tierman, Inc.	445
Will Corp. & Subsidiaries, Inc.	395

COMPRESSORS

Allis-Chalmers Mfg. Co.	636
Autoclave Engineers	346
Clark Bros. Co., Div. of Dresser Operations, Inc.	935
Croll-Reynolds Co., Inc.	1344-1346
Frick Co.	1258-1260
Fuller Co.	446
General American Transportation Corp.	436-442
Ingersoll-Rand Co.	128
Nash Engineering Co., The	238
Pressure Products Industries, Inc.	1180
Schutte & Koerting Co.	61
Voss, Inc., P. H. H.	1354-1356
York Corp., Industrial Div.	893-895-897

CONCENTRATORS

Artisan Metal Products, Inc.	874
Carbone Corp., The	803
Chemical and Industrial Corp., The	802
De Laval Separator Co., The	1211-1213
Dorr-Oliver Inc.	531
Gaigher Co., The	1054
Hunt Machine Co., Rodney	1242-1240-1244
Knapp Mills, Andrews-Knapp Construction Co., Inc.	175
Knight Co., Maurice A.	586
Niagara Blower Co., The	655
Pfaudler Co., The, Div. of Pfaudler Permitit, Inc.	110, 141
Precision Scientific Co.	370-372
Separations Engineering Corp.	996
Sharples Corp., The	485

CONDENSERS

Allis-Chalmers Mfg. Co.	636
Alloy Fabricators Div., Continental Copper & Steel Industries, Inc.	1067
American Heat Reclaiming Corp.	1056-1058
Artisan Metal Products, Inc.	874
Carbone Corp., The	803
Croll-Reynolds Co., Inc.	1344-1346
Croll-Reynolds Engineering Co., Inc.	1344-1346
Dean Thermo-Panel Coil Div., Dean Products, Inc.	184
Downdriving Iron Works, Inc., Div.	631
Pressed Steel Tank Co.	631
Electroweld Mfg. Corp.	1129
Falcon Mfg. Div., The, of The First Machinery Corp.	1174-1176
Falls Industries, Inc.	131
Fansteel Metallurgical Corp.	617
Frick Co.	1258-1260
Ingersoll-Rand Co.	128
Knapp Mills, Andrews-Knapp Construction Co., Inc.	175
Koven Fabricators, Inc.	74
Marlo Coil Co.	1053-1066
Niagara Blower Co.	655
Peabody Engineering Co.	979
Pressed Steel Tank Co.	631
Schutte & Koerting Co.	61
Scientific Development Co.	382
Scientific Glass Apparatus, Inc.	332
Smith Co., Arthur F.	1030
Southwestern Engineering Co.	1250-1252
Star Tank & Filter Corp.	233
Vogt Machine Co., Henry	124
Whitlock Mfg. Co., The	1181
York Corp., Industrial Div.	893-895-897
Young Radiator Co.	1160-1162
Yuba Consolidated Industries, Inc.	858-860

CONTACTORS

Allis-Chalmers Mfg. Co.	636
Automatic Switch Co.	847
General American Transportation Corp.	436-442
General Electric Co., Apparatus Sales Div.	482
Knight Co., Maurice A.	586
Mixing Equipment Co., Inc.	146
Packed Column Corp.	1018
Podbieliak, Inc.	595
Southwestern Engineering Co.	1250-1252

CONTAINERS

Alloy Products Corp.	1167-1169
Associated Cooperage Industries of America, Inc.	898
Bel-Art Products	1098
Bennett Industries, Inc.	1393
Cherry-Burrell Corp.	984
Continental Can Co., Inc., Robert Gair Paper Products Group, Fibre Drum & Corrugated Box Div.	899
Dean Thermo-Panel Coil Div., Dean Products, Inc.	184
Delaware Barrell & Drum Co., Inc.	1187
Gaylord Container Corp., Div. of Crown Zellerbach Corp.	1189-1193
Greif Bros. Cooperage Corp., The	41
Industrial Products Engineering Co.	1215
Metals & Controls Corp., General Plate Div.	1094
Pressed Steel Tank Co.	631
Protecto Seal Co., The	1286
Republic Steel Corp.	68
Rheem Mfg. Co.	808-810
Terris Div., Consolidated Siphon Supply Co., Inc.	1329-1331
Tote Systems, Inc.	990-992

CONTROL APPARATUS

Allis-Chalmers Mfg. Co.	636
Automatic Switch Co.	847
B.I.F. Industries, Inc.	660
Bailey Meter Co.	45
Barber-Colman Co., Wheelco Instruments Div.	1374
Beckman Instruments, Inc.	333
Brabender Instruments, Inc., C. W.	343

Brookfield Engineering Laboratories, Inc.	885-887
Falcon Alarm Co.	1343
Fisher Scientific Co.	386
Flow Actuated Control Co.	1343
Foxboro Co., The	519
Gems Co.	1343
General Electric Co., Apparatus Sales Div.	482
Healy-Ruff Co.	1343
Infilco Inc.	1163
Jacoby-Tarbox Corp.	1362
Jarco Services, Inc.	1343
Lapp Insulator Co., Inc., Process Equipment Div.	696
Magnetrail, Inc.	910-912
McIntosh Equipment Corp.	1341-1343
Mine Safety Appliances Co.	81
Minneapolis-Honeywell Regulator Co., Industrial Div.	635
Norcross Corp.	443
Philadelphia Gear Works, Inc.	164
Photovolt Corp.	389
Podbieliak, Inc.	595
Potter Aeronautical Corp.	396
Precision Scientific Co.	370-372
Ramo-Woolridge Corp., The	1068
Research Controls	1186
Superior Electric Co., The	811
Taylor Instrument Cos.	104
Technicon Co., The	316
Trerice Co., H. O.	1155-1157
Walker, Crosweller & Co., Ltd.	1343
Wallace & Tiernan, Inc.	445
Warrick Co., Charles F.	1343
Welch Mfg. Co., W. M.	205
Westinghouse Electric Corp.	510

CONTROLLERS

Allis-Chalmers Mfg. Co.	636
Automatic Switch Co.	847
Barber-Colman Cos., Wheelco Instruments Div.	1374
B.I.F. Industries, Inc.	660
Black, Sivals & Bryson, Inc.	669
Brooks Rotameter Co.	998
Burling Instrument Co.	9
DeZurik Corp.	907
Falcon Alarm Co.	1343
Fischer & Porter Co.	496 & 545
Flow Actuated Control Co.	1343
Foster Engineering Co.	947
Foxboro Co., The	519
Gems Co.	1343
General Electric Co., Apparatus Sales Div.	482
Healy-Ruff Co.	1343
Jarco Services, Inc.	1343
Leslie Co.	1333
Magnetrail, Inc.	910-912
McIntosh Equipment Corp.	1341-1343
Minneapolis-Honeywell Regulator Co., Industrial Div.	635
Norcross Corp.	443
Philadelphia Pump Div., American Meter Co.	150
Ramo-Woolridge Corp., The	1068
Robertshaw-Fulton Controls Co., Instrument Div.	1366-1368
Scientific Development Co.	382
Superior Electric Co., The	811
Thermo-Electric Co., Inc.	1111
Trerice Co., H. O.	1155-1157
Walker, Crosweller & Co., Ltd.	1343
Warrick Co., Charles F.	1343
West Instrument Corp.	1353
Westinghouse Electric Corp.	510

CONVEYING MACHINERY AND EQUIPMENT

Allen-Sherman-Hoff Co., The	1359
B.I.F. Industries, Inc.	660
Bartlett & Snow Co., The C. O.	686
Bemis Bro. Bag Co.	166
Bucket Elevator Co., The	1040
Carrier Conveyor Corp.	1321-1323, 1325-1327
Chain Belt Co.	1028
Cleveland Vibrator Co.	993-995
Commercial Filters Corp.	223
Day Co., The	13
Day Co., The J. H., Div. of The Cleveland Automatic Machine Co.	121-122

Dracco Corp.	987-989
Dravo Corp.	1150
Dean Thermo-Panel Coil Div., Dean Products, Inc.	184
Electroweld Mfg. Corp.	1129
Filtros, Inc.	854-856
Fluor Products Co.	1036
Foote Bros. Gear & Machine Corp.	14
Fuller Co.	446
General American Transportation Corp.	436-442
Great Western Mfg. Co.	216
Hapman Conveyors, Inc., Div. Hapman Dutton Co.	1345
Industrial Products Engineering Co.	1215
Jeffrey Mfg. Co., The	97
Link-Belt Co.	165
Philadelphia Gear Works, Inc.	164
Proctor & Schwartz, Inc.	684
Read Standard Div., Capitol Products Corp.	162
Renneburg & Sons Co., Edw.	1078
Sargent's Sons Corp., C. G.	1375-1377
Simplicity Engineering Co.	804
Smico Inc.	1281
Sprout, Waldron & Co., Inc.	844-846-848
Stephens-Adamson Mfg. Co.	1039
Superior Separator Co., Process Machinery Div.	1108
Syntron Co.	93
Vac-U-Max	1342

COOLERS

American Heat Reclaiming Corp.	1056-1058
Artisan Metal Products Co.	874
Bartlett & Snow Co., The C. O.	686
Blaw-Knox Co.	581
Bryant Mfg. Co.	1089
Carbone Corp., The	803
Carrier Conveyor Corp.	1321-1323 1325-1327
Cherry-Burrell Corp.	984
Croll-Reynolds Co., Inc.	1344-1346
Croll-Reynolds Engineering Co., Inc.	1344-1346
Davenport Machine & Foundry Co.	818
De Laval Separator Co., The	1211-1213
Dean Thermo-Panel Coil Div., Dean Products, Inc.	184
Dowtington Iron Works, Inc., Div. Pressed Steel Tank Co.	631
Duriron Co., The, Inc.	520-532
Frick Co.	1258-1260
General American Transportation Corp.	436-442
General Ceramics Corp.	131
Hardinge Co., Inc.	582
Havag Industries, Inc.	546
Jeffrey Mfg. Co., The	97
Peabody Engineering Corp.	979
Pfaudler Co., The Div. of Pfaudler Permitut, Inc.	110, 141
Pressed Steel Tank Co.	631
Renneburg & Sons Co., Edw.	1078
Rietz Mfg. Co.	1231
Schutte & Koerting Co.	61
Southwestern Engineering Co.	1250-1252
Sprout, Waldron & Co., Inc.	844-846-848
Standard Steel Corp.	153
Terriss Div., Consolidated Siphon Supply Co., Inc.	1329-1331
Whitlock Mfg. Co., The	1181
York Corp., Industrial Div.	893-895-897
Young Radiator Co.	1160-1162
Yuba Consolidated Industries, Inc.	858-860

COOPERAGE

Associated Cooperage Industries of America, Inc.	898
Greif Bros. Cooperage Corp.	41

COUPLINGS

Bartlett & Snow Co., The C. O.	686
Chain Belt Co.	1028
Grinnell Co., Inc.	566
Jeffrey Mfg. Co., The	97
Lead Lined Iron Pipe Co.	70
Link-Belt Co.	165
Marman Div., Aeroquip Corp.	1419
North Co., The H. W.	1216
Philadelphia Gear Works, Inc.	164

Potts Company, Horace T., Speedline Stainless Steel Fittings Div.	986
Raybestos-Manhattan, Inc.	820
Sier-Bath Gear & Pump Co., Inc.	806
Speedline Stainless Steel Fittings Div., Horace T. Potts Co.	980
Thomas Flexible Coupling Co.	1127
United States Gasket Co.	21
Walworth Co.	26

CRUCIBLES

Amersil Co., Inc.	190-192-196, 225
Baker & Co., Inc.	190-192-196, 225
Bishop & Company Platinum Works, J.	900-902
Carbone Corp., The	803
Electroweld Mfg. Corp.	1129
Engelhard Industries	190-192-196, 225
Kennametal, Inc.	1116, 1137-1139-1141-1143
Metals & Controls Corp., General Plate Div.	1094
Norton Co.	1289-1291
Precision Scientific Co.	370-372
Selas Corp. of America	973-975
Titanium Alloy Mfg. Div., National Lead Co.	234
Will Corp. & Subsidiaries, Inc.	395

CRUSHERS, GRINDING MILLS AND PULVERIZERS

Allis-Chalmers Mfg. Co.	636
Bartlett & Snow Co., The C. O.	686
Cornell Machine Co., The	1110
Dravo Corp.	1150
Eimco Corp., The	80
Enteoler Div., Safety Industries, Inc.	645
Fitzpatrick Corp.	1095
Fitzpatrick Co., Inc., The W. J.	49
Fluid Energy Processing & Equipment Co.	997
Hardinge Co., Inc.	582
International Engineering, Inc.	812
Jeffrey Mfg. Co., The	97
Kennametal, Inc.	1116, 1137-1139 1141-1143
Lehmann Co., Inc., J. M.	1205
Link-Belt Co.	165
Miller & Son, Inc., Franklin P., Supreme Crusher Div.	1010
Prater Pulverizer Co.	904-906
Pulva Corp.	220
Pulverizing Machinery Div., Metals Disintegrating Co., Inc.	632
Rietz Mfg. Co.	1231
Ross & Son Co., Charles, Inc.	983
Scientific Glass Apparatus Co., Inc.	332
Smico, Inc.	1281
Stokes Corp., F. J.	38, 67
Strong-Scott Mfg. Co., The	1138
Will Corp., Div. of Pfaudler	1142-1144
Sprout, Waldron & Co., Inc.	844
Sturtevant Mill Co.	421
Tri-Homo Corp.	214
Welch Mfg. Co., W. M.	205
Will Corp. & Subsidiaries, Inc.	395
Williams Patent Crusher & Pulverizer Co.	161

CRYSTALLIZING EQUIPMENT

Blaw-Knox Co.	581
Electroweld Mfg. Corp.	1129
Enteoler Div., Safety Industries, Inc.	645
Girdler Co., The, Votator Div., A Div. of National Cylinder Gas Co.	94
Patterson Foundry & Machine Co., The	154
Rietz Mfg. Co.	1231
Southwestern Engineering Co.	1250-1252
Swenson Evaporator Co., Div. of Whiting Corp.	85
Vogt Machine Co., Henry	124

CUTTERS

Day Co., The J. H., Div. of The Cleveland Automatic Machine Co.	121
Ingersoll Rand	122
Sprout, Waldron & Co., Inc.	844
846-848	

Stokes Corp., F. J.	38, 67
Taylor Stiles & Co.	1357

CYLINDERS FOR HIGH-PRESSURE GAS

Alloy Products Corp.	1167-1169
Autoclave Engineers	346
High Pressure Equipment Co., Inc.	1272
Hoke, Inc.	201
Koven Fabricators, Inc.	74
Pressed Steel Tank Co.	631
Pressure Products Industries, Inc.	1180

CO₂ RECORDERS

Cambridge Instrument Co., Inc.	376
Fischer & Porter Co.	496 & 545
Gow Mac Instrument Co.	1246
Mine Safety Appliances Co.	81
Minneapolis-Honeywell Regulator Co.	
Industrial Div.	635
Podbielniak, Inc.	595

DECOLORIZATION AND PURIFYING MATERIALS

Barnebey-Cheney Co.	52
Infico Inc.	1163
Smico, Inc.	1281
West Virginia Pulp and Paper Co., Industrial Chemical Sales Div.	924

DETERGENTS

Dean Thermo-Panel Coil Div., Dean Products, Inc.	184
Geigy Industrial Chemicals Div. of Geigy Chemical Corp.	916
General Laboratory Supply Co.	310
Lancaster Chemical Corp.	922
Scientific Glass Apparatus Co., Inc.	332

DIGESTERS

Alloy Fabricators Div., Continental Copper & Steel Industries, Inc.	1067
Artisan Metal Products, Inc.	874
Chemical & Pharmaceutical Industry Co., Inc.	1064
Dean Thermo-Panel Coil Div., Dean Products, Inc.	184
Downtown Iron Works, Inc., Div. of Pressed Steel Tank Co.	631
Eimco Corp., The	80
Electroweld Mfg. Corp.	1129
General American Transportation Corp.	436-442
Knapp Mills, Andrews-Knapp Construction Co., Inc.	175
Koven Fabricators, Inc.	74
Lukens Steel Co.	876
Misco, Inc.	1037
North Co., The H. W.	1216
Precision Scientific Co.	370-372
Pressed Steel Tank Co.	631
Ross & Son Co., Charles, Inc.	983
Southwestern Engineering Co.	1250-1252
Sprout, Waldron & Co., Inc.	844-846-848
Standard Steel Corp.	153
Swenson Evaporator Co., Div. Whiting Corp.	85

DISSOLVERS

American Well Works, The	1390
Artisan Metal Products, Inc.	874
Baker-Perkins, Inc. Chemical Machinery Div.	560 & 609
Day Co., The J. H., Div. of The Cleveland Automatic Machine Co.	121-122
Dravo Corp.	1150
General American Transportation Corp.	436-442
Gifford-Wood Co.	219
Hockmeyer & Co., Herman	1178
International Engineering, Inc.	812
Morehouse-Cowles, Inc.	814
New England Tank & Tower Co.	79
North Co., The H. W.	1216
Patterson Foundry & Machine Co., The	154

Rietz Mfg. Co.	1231
Ross & Son Co., Inc., Charles	983
Southwestern Engineering Co.	1250-1252
Terriss Div., Consolidated Siphon Supply Co., Inc.	1329-1331

DISTILLING MACHINERY AND APPARATUS

Aetna Scientific Co.	363
Alloy Fabricators Div., Continental Copper & Steel Industries, Inc.	1067
Artisan Metal Products, Inc.	874
American Sterilizer Co.	366
Barnstead Still & Demineralizer Co.	416
Blaw-Knox Co.	581
Chemical & Pharmaceutical Industry Co., Inc.	1064
Dean Thermo-Panel Coil Div., Dean Products, Inc.	184
Electric Hotpack Co., Inc., The	373-375
Mannesmann-Easton Plastic Products Co., Inc.	1115
Packed Column Corp.	1018
Pfaudler Co., The Div., Pfaudler Permutit, Inc.	110, 141
Podbielniak, Inc.	595
Precision Scientific Co.	370-372
Seavy & Sons, M. J.	1071
Scientific Development Co.	382
Scientific Glass Apparatus Co., Inc.	332
Smith Co., Arthur F.	1030
Southwestern Engineering Co.	1250-1252
Stanford Glassblowing Laboratories	1071
Stokes Corp., F. J.	38, 67
Star Tank & Filter Corp.	233
Terriss Div., Consolidated Siphon Supply Co., Inc.	1329-1331
Will Corp. & Subsidiaries, Inc.	395

DRIVES

Allis Co., The Louis	100
Allis-Chalmers Mfg. Co.	636
Bartlett & Snow Co., The C. O.	686
Chain Belt Co.	1028
Cleveland Worm & Gear Co., The	158
Electro-Dynamic Div., General Dynamics Corp.	1152
Foote Mineral Gear and Machine Corp.	14
Frick Co.	1258-1260
General Electric Co., Apparatus Sales Div.	482
Great Western Mfg. Co.	216
Jeffrey Mfg. Co., The	97
Link-Belt Co.	165
New England Tank & Tower Co.	79
North Co., The H. W.	1216
Pfaudler Co., The Div. of Pfaudler Permutit, Inc.	110, 141
Philadelphia Gear Works, Inc.	164
Raybestos-Manhattan, Inc.	820
Reeves Pulley Co., Div. of Reliance Electric & Engineering Co.	1285-1287
U.S. Electrical Motors, Inc.	837
Westinghouse Electric Corp.	510

DRUMS, ROTARY AND VACUUM

Alloy Fabricators Div., Continental Copper & Steel Industries, Inc.	1067
Blaw-Knox Co.	581
De Laval Separator Co., The	1211-1213
Dravo Corp.	1150
Eimco Corp., The	80
General American Transportation Corp.	436-442
Greif Bros. Cooperage Corp., The	41
Renneburg & Sons Co., Edw.	1078
Stokes Corp., The F. J.	38, 67
Swenson Evaporator Co. Div. Whiting Corp.	85
Terriss Div., Consolidated Siphon Supply Co., Inc.	1329-1331

DRYERS, CENTRIFUGAL

American Tool & Machine Co.	862
Baker-Perkins, Inc., Chemical Machinery Div.	560 & 609
Bird Machine Co.	685
Blaw-Knox Co.	581
Dorr-Oliver, Inc.	531
Electroweld Mfg. Corp.	1129
Fletcher Works, Inc.	459
Nichols Engineering & Research Corp.	624

Patterson-Kelley Co., Inc., The	188-215
Pfaudler Co., The, Div. of Pfaudler Permutit, Inc.	110, 141
Sharples Corp., The	485
Smico, Inc.	1281
Smith Corp., A. O.	596

DRYING MACHINERY AND EQUIPMENT

Allis-Chalmers Mfg. Co.	636
Alloy Fabricators Div., Continental Copper & Steel Industries, Inc.	1067
American Gas Furnace Co.	833
Anderson Co., The V. D., Div. of International Basic Economy Corp.	1265
Bartlett & Snow Co., The C. O.	686
Blaw-Knox Co.	581
Bowen Engineering, Inc.	706
Bryant Mfg. Co.	1089
Carrier Conveyor Corp.	1321-1323
Carver, Inc., Fred S. Combustion Engineering, Inc., Raymond Div.	1325-1327
Dean Thermo-Panel Coil Div., Dean Products, Inc.	184
Davenport Machine & Foundry Co.	818
Despatch Oven Co.	1168-1170
Dorr-Oliver, Inc.	531
Dravo Corp.	1150
Eimco Corp., The	80
Electric Hotpack Co., Inc.	373-375
Electroweld Mfg. Corp.	1129
Fitzpatric Corp.	1095
General American Transportation Corp.	436-442
Hardinge Co., Inc.	582
Hunt Machine Co., Rodney	1240-1242-1244
Imperial Brass Mfg. Co., The	894-896
Jeffrey Mfg. Co.	97
Lennard Co., Inc., P. M.	1227
Link-Belt Co.	165
Marlo Coil Co.	1053-1066
Milton Roy Co.	610
Nichols Engineering & Research Corp.	624
North Co., The H. W.	1216
Patterson Foundry & Machine Co., The	154
Pfaudler Co., The, Div. of Pfaudler Permutit, Inc.	110, 141
Precision Scientific Co.	370-372
Proctor & Schwartz, Inc.	684
Renneburg & Sons Co., Edw.	1078
Rietz Mfg. Co.	1231
Sargent's Sons Corp., C. G.	1375-1377
Smico, Inc.	1281
Standard Steel Corp.	153
Steiner-Ives Co.	1381
Stokes Corp., F. J.	38, 67
Swenson Evaporator Co. Div. of Whiting Corp.	85
Trinity Equipment Corp.	1392
Wiegand Co., Edwin L.	850

DUST AND FUME COLLECTING SYSTEMS

Alloy Fabricators Div., Continental Copper & Steel Industries, Inc.	1067
American Air Filter Co., Inc.	676
Automotive Rubber Co., Inc.	134-1136
Catalytic Combustion Corp.	1165
Colonial Plastics Mfg. Co., The Industrial Div.	1262-1264
Day Co., The	13
Dean Thermo-Panel Coil Div., Dean Products, Inc.	184
Dracco Corp.	843
Ducon Co., Inc., The	1033
Dustex Corp.	1299-1301
Enteleter Div., Safety Industries, Inc.	645
Fibercast Corp., The	1391
General American Transportation Corp.	436-442
Havex Industries, Inc.	546
Heil Process Equipment Corp.	1305
Industrial Plastic Fabricators, Inc.	1217
Industrial Products Engineering Co.	1215
Knapp Mills, Andrews-Knapp Construction Co., Inc.	175
Knight Co., Maurice A.	586
Lennard Co., Inc., P. M.	1227
National Dust Collector Corp.	675
Pangborn Corp.	681
Peabody Engineering Corp.	979

Pulverizing Machinery Div., Metals Disintegrating Co., Inc.	632
Renneburg & Sons Co., Edw.	1078
Schutte & Koerting Co.	61
Schutz-O'Neill Co.	838
Simpson Mix Muller Div. of National Engineering Co.	675
Sly Mfg. Co., The W. W.	73
Smico, Inc.	1281
Standard Steel Corp.	153
Sprout, Waldron & Co., Inc.	844-846-848
Vac-U-Max	1342
Westinghouse Electric Corp.	510
Wheelabrator Corp.	46

DUST AND SPRAY MASKS

Mine Safety Appliances Co.	81
Pangborn Corp.	681

EJECTORS

Artisan Metal Products, Inc.	874
Carbone Corp., The	803
Croll-Reynolds Co., Inc.	1344-1346
Duriron Co., Inc., The	520-532
General Ceramics Corp.	131
Ingersoll-Rand Co.	128
Schutte & Koerting Co.	61
Southwestern Engineering Co.	1250-1252

ELECTRONIC EQUIPMENT

Allis-Chalmers Mfg. Co.	636
Atlantic Research Corp.	1424-1426
Automatic Switch Co.	847
Barnstead Still & Demineralizer Co.	416
Carlisle Gas Burners	1255
Exact Weight Scale Co.	1371-1373
Fairbanks, Morse & Co.	1164-1166
Fisher Scientific Co.	386
General Electric Co., Apparatus Sales Div.	482
General Electric Co., Missile & Ordnance Systems Dept.	1431
Havex Industries, Inc.	546
Jeffrey Mfg. Co., The	97
Minneapolis-Honeywell Regulator Co., Industrial Div.	635
Photovolt Corp.	389
Potter Aeronautical Corp.	396
Precision Scientific Co.	370-372
Ramo-Woolridge Corp., The	1068
Reliance Electric & Engineering Co.	1285-1287
Superior Electric Co., The	811
Welch Mfg. Co., W. M.	205
Westinghouse Electric Corp.	518
Fischer & Porter Co.	496 & 545

ELEVATORS

Barrett-Cravens Co.	127
Bartlett & Snow Co., The C. O.	686
Carrier Conveyor Corp.	1321-1323-1325-1327
Great Western Mfg. Co.	216
Hapman Conveyors, Inc., Div. of Hapman-Dutton Co.	1345
Jeffrey Mfg. Co., The	97
Link-Belt Co.	165
National Dust Collector Corp.	675
Renneburg & Sons Co., Edw.	1078
Simpson Mix Muller Div., National Engineering Co.	675
Smico, Inc.	1281
Stephens-Adamson Mfg. Co.	1039
Sturtevant Mill Co.	421
Westinghouse Electric Corp.	510

EMULSIFIERS

Artisan Metal Products, Inc.	874
Chemicalloid Laboratories, Inc.	618
Cherry-Burrell Corp.	984
Cornell Machine Co., The	1110
Geigy Industrial Chemical, Div. of Geigy Chemical Corp.	916
Gifford-Wood Co.	219
Girdler Co., The, Votator Div., Div. of National Cylinder Gas Co.	94
International Engineering, Inc.	812
Lancaster Chemical Corp.	922
Manton-Gaulin Mfg. Co., Inc.	51
Mixing Equipment Co., Inc.	146

Morehouse-Cowles, Inc.	814
North Co., The H. W.	1216
Patterson Foundry & Machine Co., The	154
Ross & Son Co., Inc., Charles	983
Sonic Engineering Corp.	1122
Tri-Homo Corp.	214
Victor Chemical Works	936-938-940-963
West Virginia Pulp and Paper Co., Industrial Chemical Sales Div.	924

ENAMELED APPARATUS

Pfaudler Co., The, Div. of Pfaudler Permutit, Inc.	110, 141
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ENAMELS

Lead Industries Assn.	816
United States Stoneware Co., The	111

ENGINEERS

Artisan Metal Products, Inc.	874
Atlantic Research Corp.	1424-1426
Bartlett & Snow Co., The C. O.	686
Blaw-Knox Co.	581
Bowen Engineering, Inc.	706
Crawford & Russell Inc.	1000
Frick Co.	1258-1260
Galigher Co., The	1054
General Electric Co., Missile & Ordnance Systems Dept.	1431
Girdler Co., The, Votator Div., A Div. of National Cylinder Gas Co.	94
Grinnell Co., Inc.	566
Frick Co.	1258-1260
Jeffrey Mfg. Co., The	97
Lehmann Co., Inc., J. M.	1205
Link-Belt Co.	165
Protectoseal Co., The	1286
Ramo-Woolridge Corp., The	1068, 1453
Renneburg & Sons Co., Edw.	1078
Sharples Corporation, The	485
Smico, Inc.	1281
Southwestern Engineering Co.	1250-1252
Sprout, Waldron & Co.	844-846-848
Standard Steel Corp.	153
Stephens-Adamson Mfg. Co.	1039
Superior Separator Co., Process Machinery Div.	1108
Trent, Inc.	195
Vac-U-Max	1342
Voss Company, Inc., J. H. H.	1354-1356

EVAPORATORS

Artisan Metal Products, Inc.	874
Barnstead Still & Demineralizer Co.	416
Blaw-Knox Co.	581
Carbone Corp., The	803
Dean Thermo-Panel Coil Div. of Dean Products, Inc.	184
Downtown Iron Works, Inc., Div. of Pressed Steel Tank Co.	631
Electroweld Mfg. Corp.	1129
Falcon Mfg. Div., The, of The First Machinery Corp.	1174-1176
Falls Industries, Inc.	131
Fischer & Porter Co.	496, 545
Frick Co.	1258-1260
Hunt Machine Co., Rodney	1240-1242-1244
Knapp Mills, Andrews-Knapp Construction Co., Inc.	175
Marlo Coil Co.	1053-1066
Metals & Controls Corp., General Plate Div.	1094
Niagara Blower Co.	655
Pfaudler Co., The, Div. of Pfaudler Permutit, Inc.	110, 141

Precision Scientific Co.	370-372
Pressed Steel Tank Co.	631
Renneburg & Sons Co., Edw.	1078
Rietta Mfg. Co.	1231
Schutte & Koerting Co.	61
Scientific Glass Apparatus Co., Inc.	332
Southwestern Engineering Co.	1250-1252
Swenson Evaporator Co., Div. of Whiting Corp.	85
Vogt Machine Co., Henry	124
York Corp., Industrial Div.	893-895-897
Young Radiator Co.	1160-1162
Yuba Consolidated Industries, Inc.	858-860

EXHAUSTERS

Allis-Chalmers Mfg. Co.	636
Colonial Plastics Mfg. Co., The, Industrial Div.	1262-1264
Croll-Reynolds Co., Inc.	1344-1346
Day Co., The	13
Du Verre, Inc.	1049
Havex Industries, Inc.	546
Heil Process Equipment Corp.	1305
Industrial Plastic Fabricators, Inc.	1217
Ingersoll-Rand Co.	128
Lennard Co., Inc., P. M.	1227
Renneburg & Sons Co., Edw.	1078
Smico, Inc.	1281
Vac-U-Max	1342
Fluor Products Co.	1036
Schutte & Koerting Co.	61

EXTRACTION PLANTS

Alloy Fabricators Div., Continental Copper & Steel Industries, Inc.	1067
Anderson Co., The V. D. of International Basic Economy Corp.	1265
Artisan Metal Products, Inc.	874
Bartlett & Snow Co., The C. O.	686
Blaw-Knox Co.	581
Podbielnik, Inc.	595
Smico, Inc.	1281
Terriss Div. of Consolidated Siphon Supply Co., Inc.	1329-1331

EXTRACTORS

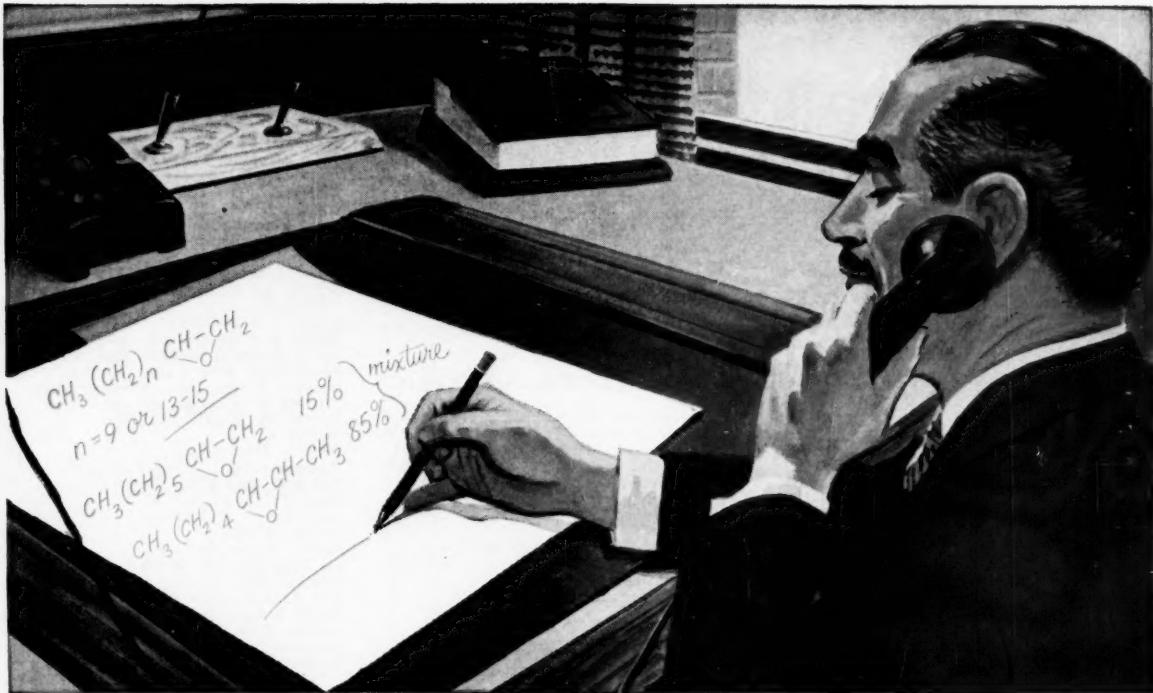
American Machine & Metals, Inc.	456, 506, 556
American Tool & Machine Co.	862
Anderson Co., The V. D. Div. of International Basic Economy Corp.	1265
Artisan Metal Products, Inc.	874
Bird Machine Co.	685
Blaw-Knox Co.	581
Centrico, Inc.	842
De Laval Separator Co., The	1211-1213
Fletcher Works, Inc.	459
General American Transportation Corp.	436-442
Koven Fabricators, Inc.	74
Mixing Equipment Co., Inc.	146
Peerless Mfg. Co.	1008
Podbielnik, Inc.	595
Precision Scientific Co.	370-372
Scientific Development Co.	382
Scientific Glass Apparatus Co., Inc.	332
Smico, Inc.	1281
Tolhurst Centrifugals Div., American Machine & Metals, Inc.	506
York Co., Inc., Otto M.	69

FANS

Colonial Plastics Mfg. Co., The, Industrial Div.	1264
Day Co., The	13
Dracco Corp.	987-989
Du Verre, Inc.	1049
Duriron Co., Inc., The	520-532
Fluor Products Co.	1036
Fuller Co.	446
General American Transportation Corp.	436-442
Havex Industries, Inc.	546
Heil Process Equipment Corp.	1305
Industrial Plastic Fabricators, Inc.	1217
International Engineering, Inc.	812
Marlo Coil Co.	1053-1066
Niagara Blower Co.	655
Renneburg & Sons Co., Edw.	1078
Smico, Inc.	1281
Sprout, Waldron & Co.	844-846-848
Westinghouse Electric Corp.	510

FEEDERS

Allen-Sherman-Hoff Co., The	1359
American Machine & Metals, Inc.	456, 506, 566
B.I.F. Industries, Inc.	660
Bartlett & Snow Co., The C. O.	686
Bucket Elevator Co., The	1040
Carrier Conveyor Corp.	1321-1323-1327
Day Co., The	13
Day Co., The J. H., Div. of Cleveland Automatic Machine Co.	121



Where can you use Olefin Epoxides, now available in development quantities?

Perhaps we can offer a few suggestions. New Olefin Epoxides now available in development quantities from Becco are showing great promise in applications, such as:

1. general solvents
2. solvents and reactive diluents for epoxy resins
3. intermediates in manufacture of:
perfumeries, cosmetics, surfactants, plastics, lubricants
4. acid scavengers
5. corrosion inhibitors
6. stabilizers for chlorinated compounds
7. monomers
8. organic synthesis intermediates

These epoxidized Olefins, developed by Becco as a result of extensive research in epoxidation reactions, combine variable length hydrocarbon structures with reactive epoxy groups and undergo reactions such as polymerization, isomerization, reduction and ring-opening with a variety of active hydrogen compounds.

The compounds offered are high assay epoxides:

	F.P.°C	B.P.°C	Density at 25°C	Solubility
OCTYLENE OXIDE mixed 1,2-and 2,3-epoxy-n-octanes	< -50	76-78 (45mm)	0.830	very slightly soluble in water, soluble in hydrocarbons and other organic solvents.
DODECENE OXIDE 1,2-epoxy-n- dodecane	ca -10	97-98 (3.5mm)	0.836	insoluble in water, sol- uble in hydrocarbons and other organic solvents.
C ₁₆ -C ₁₈ OLEFIN OXIDE mixed 1,2- epoxy-n-hexadecane and n-octadecane	ca 15	>110 (0.5mm)	0.842	insoluble in water, sol- uble in hydrocarbons and other organic solvents.

If you are interested in possible applications of these epoxy compounds, we shall be glad to supply experimental quantities and technical assistance. Why not begin by writing for your free copies of Bulletins 72, 73, and 74—there is no obligation.

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Thayer Scale Corp.	1350-1352
Vibra Screw Co.	1363
Wallace & Tiernan, Inc.	445

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Brown Co.	923
Dicalite Div., Great Lakes Carbon Corp.	204
Quaker Oats Co., The, Chemicals Dept.	953
Synthetic Mica Corp., Subsidiary of Mycalex	948
Titanium Alloy Mfg. Div., National Lead Co.	234

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Arenco Machine Co., Inc.	1079
Artisan Metal Products, Inc.	874
B.I.F. Industries, Inc.	660
Black Products Co.	1319
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Chemical & Pharmaceutical Industry Co., Inc.	1064
Cherry-Burrell Corp.	984
Colton Company, Arthur, Div. of Snyder Tool & Engineering Co.	50
Ertel Engineering Corp.	623
Exact Weight Scale Co.	1371-1373
Glengarry, Inc.	60
Haring Equipment Corp.	1092
Lapp Insulator Co., Inc., Process Equipment Div.	696
Richardson Scale Co.	1151-1153
Pfaudler Co., The, Div. of Pfaudler Permutit, Inc.	10, 141
Popper & Sons, Inc.	864
Smico, Inc.	1281
Thayer Scale Corp.	1350-1352
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Dicalite Div., Great Lakes Carbon Corp.	204
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Vibra Screw Co.	1363
West Virginia Pulp and Paper Co., Industrial Chemical Sales Div.	924
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FILTER CLOTH

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Filtration Engineers, Inc.	456
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Nat'l Filter Media Corp.	1113
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Shriver & Co., Inc., T.	473
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Hercules Filter Corp.	213
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Micro Metallic Corp.	1012-1014
Multi-Metal Wire Cloth Co., Inc.	191
Newark Wire Cloth Co.	183
Smico, Inc.	1281
Terriss Div., Consolidated Siphon Supply Co., Inc.	1329-1331
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Ertel Engineering Corp.	623
Fisher Scientific Co.	386
General Laboratory Supply Co.	310
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Hormann & Co., Inc.	977
Jacoby-Tarbox Corp.	1362
Nat'l Filter Media Corp.	1113
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Shriver & Co., Inc., T.	473
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Star Tank & Filter Corp.	233
Terriss Division, Consolidated Siphon Supply Co., Inc.	1329-1331
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Komline-Sanderson Engineering Corp.	1100
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Rockwood Sprinkler Co.	1296-1298

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Grinnell Co., Inc.	566
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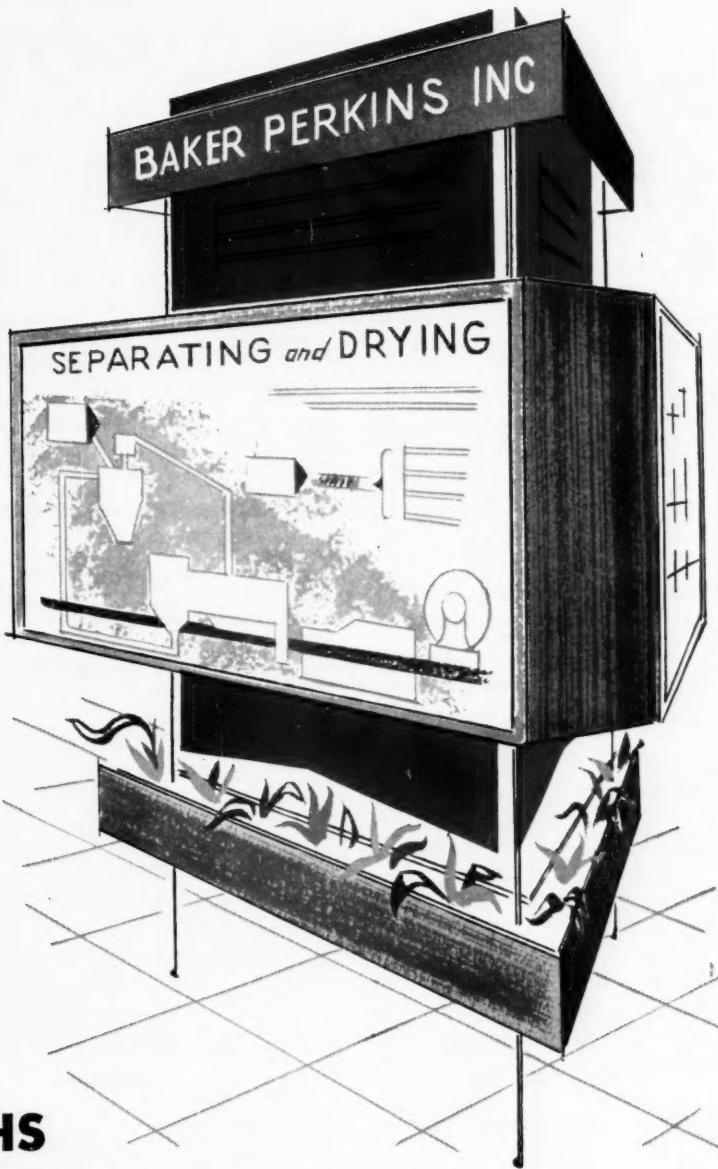
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Kimble Glass Co., Subsidiary of Owens-Illinois	390
New York Laboratory Supply Co., Inc.	1022
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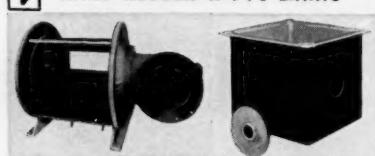
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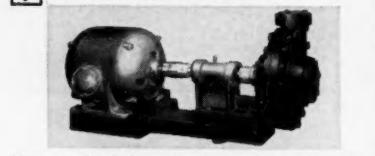
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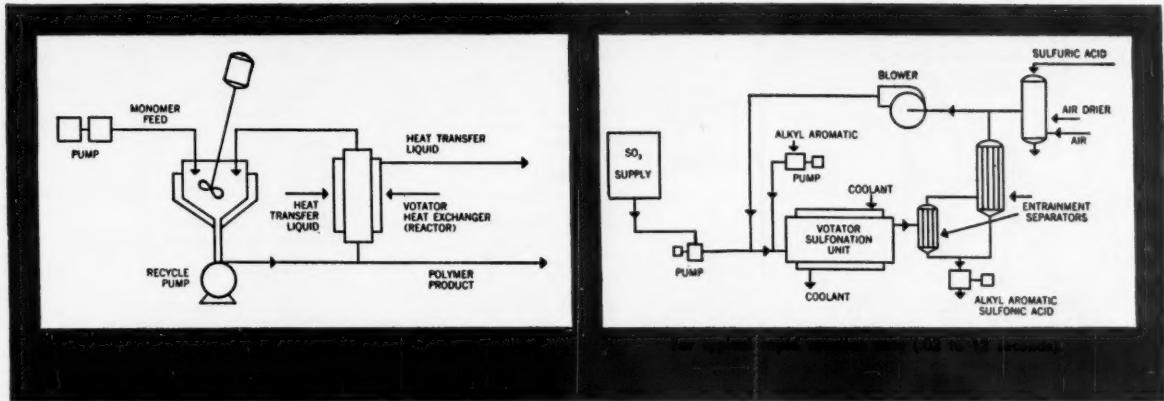
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Miller & Son, Inc., Franklin P.	Supreme Crusher Div.	1010
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Anderson Co., The V. D. Div. of International Basic Economy Corp.	1265
American Hydrotherm Corp.	1161
Bryant Mfg. Co.	1089
Carbone Corp., The	803



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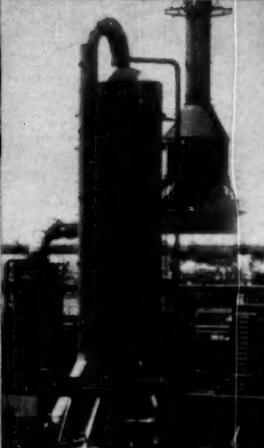
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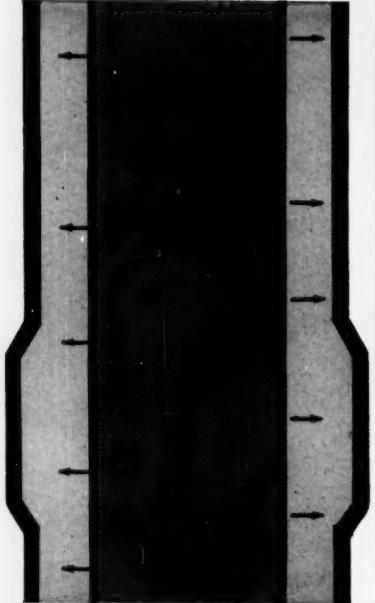
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Pennsylvania Fluorocarbon Co., Inc.	969
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Reynolds Metals Co.	1348-1367-1369
Sel-Rex Corp.	985
Titanium Alloy Mfg. Div., National Lead Co.	234
Union Steel Corp.	840
United States Steel Corp.	495

METERS

Analytical Measurements, Inc.	314
B-I-F Industries, Inc.	660
Bailey Meter Co.	45
Barnstead Still & Demineralizer Co.	416
Brooks Rotameter Co.	998
Buffalo Meter Co.	937
Fischer & Porter Co.	496, 545
Foster Engineering Co.	947
Foxboro Co., The	519
Hart-Moisture-Meters, Raymond S. Hart Inc.	369
Jacoby-Tarbox Corp.	1362
Norcross Cos., Sterling E., Kem Feed Div.	1372
Philadelphia Pump Div., American Meter Co.	150
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Brinkmann & Co., C. A.	360
New York Laboratory Supply Co., Inc.	1022
Perkin-Elmer Corp., The	1081-1083
Scientific Glass Apparatus Co., Inc.	332
Standard Scientific Supply Corp.	1131
Welch Mfg. Co., W. M.	205
Will Corporation & Subsidiaries, Inc.	395

MILLS

Allis-Chalmers Mfg. Co.	636	
Bartlett & Snow Co., The C. O.	686	
Blaw-Knox Co.	581	
California Pellet Mill Co.	1358-1360	
Chemicalloid Laboratories, Inc.	618	
Combustion Engineering, Inc., Ray-	mond Div.	646
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Dravo Corp.	1150	
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International Engineering, Inc.	812	
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Manton-Gaulin Mfg. Co., Inc.	51	
Miller & Son, Inc., Franklin P., Supreme Crusher Div.	1010	
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Rietz Mfg. Co.	1231	
Ross & Son Co., Inc., Charles	983	
Schutz-O'Neill Co.	838	
Smico, Inc.	1281	
Sprout, Waldron & Co., Inc.	844-846-848	
Strong, Scott Mfg. Co., The	1138-1142-1144	
Sturtevant Mill Co.	421	
Tri-Homo Corp.	214	
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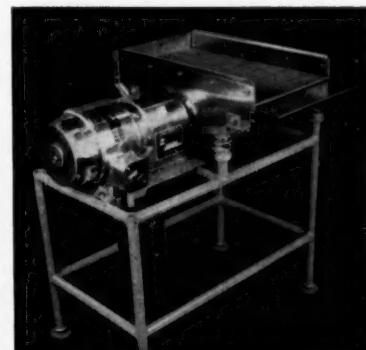
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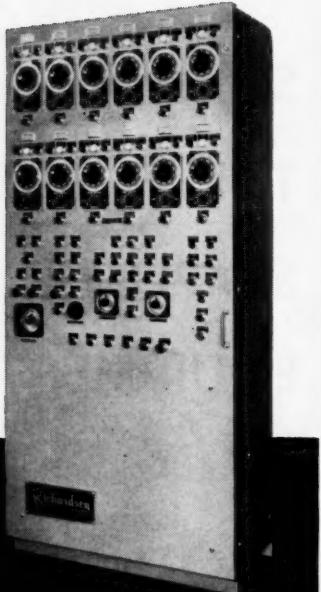
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Scientific Glass Apparatus Co.	332
Therm-Electric Co., Inc.	1111
Tyrite Co., H. O.	1155-1157
Uhling Instrument Co.	364
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Dow Chemical Co., The, Magnesium Dept.	1429
Haynes Stellite Co., Div. of Union Carbide Corp.	460
Montecatini Societa Generale	930-932-934,
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Baker-Perkins, Inc. Chemical Machinery Div.	560 & 609
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Knapp Mills, Andrews-Knapp Construction Co., Inc.	175
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Proctor & Schwartz, Inc.	684
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Brager Co., Inc., Norman	1349-1351
Fischer Scientific Co.	386
Fisher & Porter, Inc.	496, 545
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General Electric Co., Apparatus Sales Div.	482
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Minneapolis-Honeywell Regulator Co., Industrial Div.	635
Norcross Corp.	443
Perkin Elmer Corp., The	1081-1083
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Tyrite Co., H. O.	1155-1157
Uhling Instrument Co.	364
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Allis-Chalmers Mfg. Co.	636
General Electric Co., Apparatus Sales Div.	482
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Knapp Mills, Andrews-Knapp Construction Co., Inc.	175
Sel-Rex Corp.	985
Southwestern Engineering Co.	1250-1252
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Westinghouse Electric Corp.	510

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Norton Co.	1289-1291
Reynolds Metals Co.	1348, 1367-1369
Titanium Alloy Mfg. Div., National Lead Co.	234

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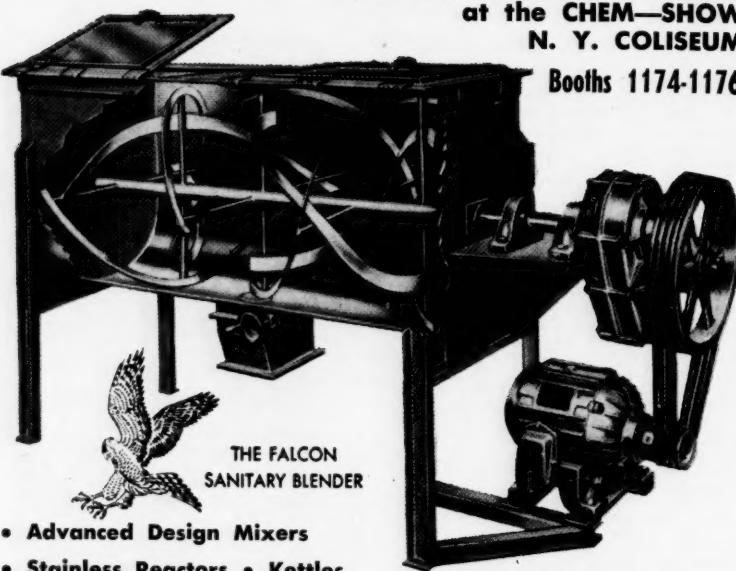
Ansul Chemical Co.	95
Cherry-Burrell Corp.	984
Croll-Reynolds Co., Inc.	1344-1346
Dean Thermo-Panel Coil Div., Dean Products, Inc.	184
Electric Hotpack Co., Inc.	373-375
Frick Co.	1258
Hoke, Inc.	446
Ingersoll-Rand Co.	201
Magnetrol, Inc.	128
Marlo Coil Co.	910-912
Niagara Blower Co.	1053-1066
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York Corp., Industrial Div.	893-895-897
Yuba Consolidated Industries, Inc.	858-860
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REGULATORS, PRESSURE AND TEMPERATURE

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Black, Sivalls & Bryson, Inc.	669

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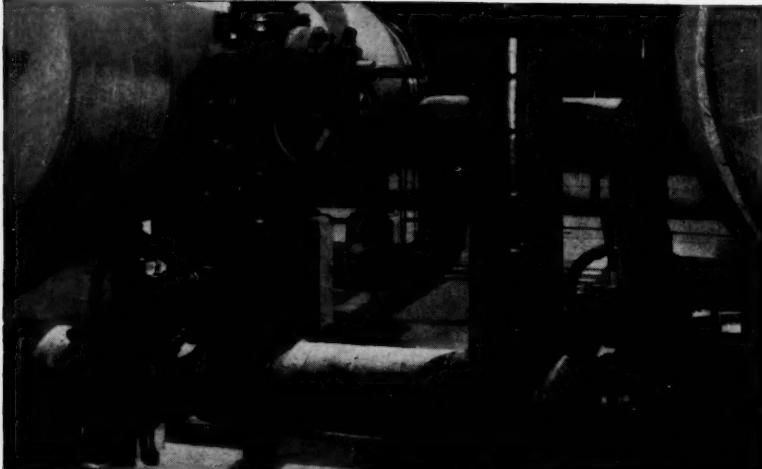
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Hoke, Inc.	201
Leslie Co.	1333
Minneapolis-Honeywell Regulator Co., Industrial Div.	635
Precision Scientific Co.	370-372
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Brooks Rotameter Co.	998
Fischer & Porter, Inc.	496, 545
Foxboro Co., The	519
Hoke, Inc.	201
Jacoby-Tarbox Corp.	1362
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Scientific Glass Apparatus Co., Inc.	332
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Automotive Rubber Co., Inc.	1134-1136
Baker-Perkins, Inc., Chemical Machinery Div.	560 & 609
Bishopric Products Co., The	378
Crane Co.	422

Dean Thermo-Panel Coil Div., Dean Products, Inc.	184
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Garlock Packing Co., The	415
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Ross & Son Co., Inc., Charles	983
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Pfaudler Co., The, Div. of Pfaudler Permutit, Inc.	110, 141
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Ansil Chemical Co.	95
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Logan Emergency Showers, Inc.	883
Magnetroil, Inc.	910-912
Mine Safety Appliances Co.	81
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B-I-F Industries, Inc.	660
Bemis Bro. Bag Co.	166
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Mettler Instrument Corp.	339
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Thayer Scale Corp.	1350-1352
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Miller & Son, Inc., Franklin P., Supreme Crusher Div.	1010
Multi-Metal Wire Cloth Co., Inc.	191
Newark Wire Cloth Co.	183
Niagara Filters Div., American Machine & Metals, Inc.	556
Patterson Foundry & Machine Co., The	154
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Read Standard, Div., Capitol Products Corp.	162
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Smico, Inc.	1281
Southwestern Engineering Co.	1250-1252
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Stephens-Adamson Mfg. Co.	1039

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Great Western Mfg. Co.	216
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Newark Wire Cloth Co.	183
Niagara Filters Div., American Machine & Metals, Inc.	556
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Anderson Co., The V. D., Div. of International Basic Economy Corp.	1265
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Sprout, Waldron & Co., Inc.	844-846-848
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Southwestern Engineering Co.	1250-1252
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Allis-Chalmers Mfg. Co.	636
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Blaw-Knox Co.	581
Dean Thermo-Panel Coil Div., Dean Products, Inc.	184
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Vac-U-Max	1342

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Precision Scientific Co.	370-372
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Wallace & Tiernan, Inc.	445
Will Corporation & Subsidiaries, Inc.	395

STILLS

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Alloy Fabricators Div., Continental Copper & Steel Industries, Inc.	1067
American Sterilizer Co.	366
Artisan Metal Products, Inc.	874
Barnstead Still & Sterilizer Co., Inc.	416
Chemical & Pharmaceutical Industry Co., Inc.	1064
Electric Hotpack Co., Inc.	373-375
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Multi-Metal Wire Cloth Co., Inc.	191
Newark Wire Cloth Co.	183
Parks-Cramer Co.	55
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Jarco Services, Inc.	1343
Magnetrol, Inc.	910-912
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Minneapolis-Honeywell Regulator Co., Industrial Div.	635

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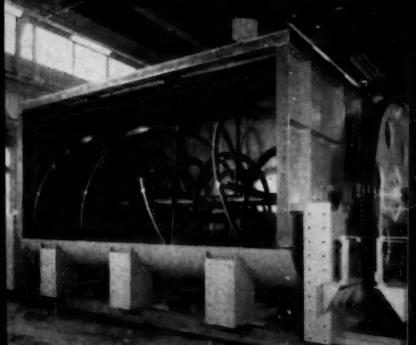


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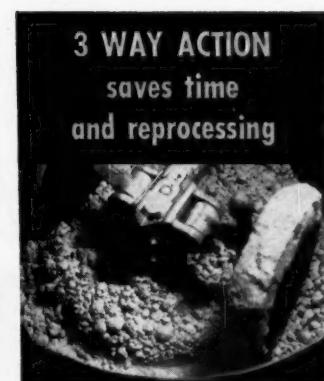
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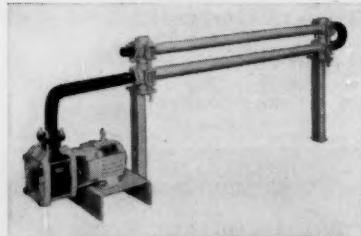
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Packaged "Karbate" Recirculating-Type Heat Transfer Systems for Plating Applications



Corrosion resistance, long life, low cost — these are some of the advantages of the "Karbate" recirculating-type heat transfer system. Designed for economical heating and cooling of plating solutions, the system features proven "Karbate" centrifugal pump and concentric tube heat exchangers.

Standard package units, available immediately, provide 4.1 to 35.2 square feet of heat transfer surface and circulating pump capacities of 20 to 100 gallons per minute.

For details, contact National Carbon Company, P.O. Box 6087, Cleveland, O.

"Intalox" Saddle Packing Now Available in Carbon

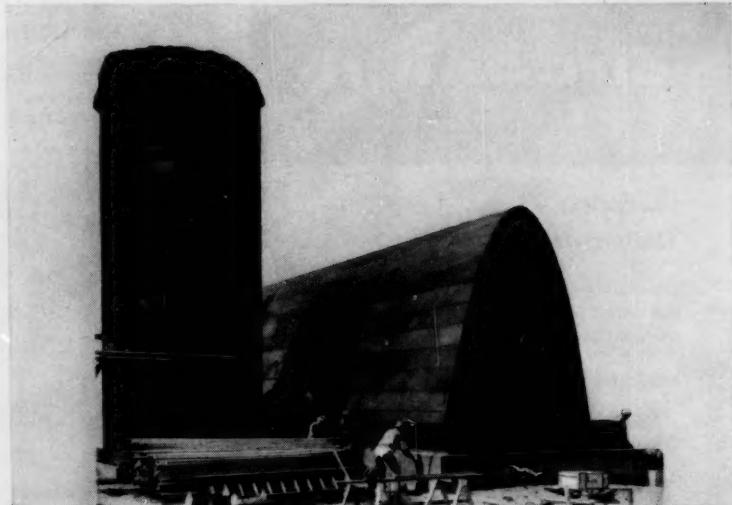


Developed jointly by National Carbon Company and U. S. Stoneware Company, new carbon saddle packing has a wide range of chemical applications.

The new types saddles, sold under U. S. Stoneware's trademark "INTALOX", are recommended for hot alkalis, mixtures of hydrofluoric and sulfuric acids, hydrofluoric and phosphoric acids—applications where chemical resistant ceramics would be unsuitable. The new carbon saddles can withstand abrupt temperature changes without danger of spalling. Saddles assure maximum contact surface between liquid and gas or between liquid and liquid.

For details, contact U. S. Stoneware, 60 East 42nd Street, New York 17, N.Y.

VERSATILE CARBON AND GRAPHITE STRUCTURES CUT COSTS IN HIGH TEMPERATURE CORROSIVE PROCESSES



This installation has one of the largest capacity combustion chambers ever built. Made of graphite, the burner chamber (on right) and the carbon hydrator tower (on left) produce phosphoric acid from elemental phosphorus for the Shea Chemical Co. of Jeffersonville, Ind.

Corrosion resistance and structural stability at high temperatures make carbon and graphite invaluable in combustion chambers, reactor vessel linings, bubble cap trays and packing support structures. Virtually immune to thermal shock, and with little expansion under heat, carbon and graphite can be used in reducing atmospheres up to 3000°C. Furthermore, high thermal conductivity enables water-cooled graphite structures to withstand up to 2000°F under oxidizing conditions.

Easily machined to close tolerances, carbon and graphite can be worked even by hand tools. Depending on size and process requirements, the materials can be supplied for either monolithic or segmental structures. Segmental structures have been built with walls 20' long x 15' high, using blocks 7½" thick, 28½" wide and 72" long.



After a carbon or graphite structure is completed, shoring is removed. Special high joint-strength cement with essential properties of carbon and graphite bonds the blocks or slabs.



The terms "National", "N" and Shield Device, "Karbate" and "Union Carbide" are registered trade-marks of Union Carbide Corporation.



PRODUCTION



CIAB's Henderson, top aides,* report on progress in chemical industry standards at San Francisco.

Standards Parley Stakes Out Savings

At the recent 39th annual meeting of the American Standards Assn. at San Francisco, the Chemical Industry Advisory Board reported on equipment standards that could lead to industry savings of well over \$10 million.

As it has done before, CIAB took the annual ASA meeting as occasion to hold its fall meeting. CIAB chairman J. G. Henderson, of Union Carbide Chemicals Co., reported to the group of 19 members and guests that the long-awaited standards for centrifugal pumps are a step closer to being a reality. Draft standards are expected by next February, could win approval from ASA by the end of next year.

In practice, established standards could mean less downtime and replacement inventory, result in estimated \$6.8-million savings to chemical firms. An ASA committee had the task of thinning about 132,000 different pumps

down to far fewer standard models. The committee got pump manufacturers to accept these standards that, among other benefits, will enable pump users to obtain replacements from more than one manufacturer.

In the Works: Henderson also reported that formation of an ASA committee to study establishment of standards for cooling towers is now under way. One of the most important areas for study: materials of construction, including new materials, coatings and preservatives to supplement traditional, redwood (*CW*, Nov. 3, '56, p. 126). "Since candidates for the subcommittee are now predominantly from cooling-tower manufacturers and wood producers, there appears to be a favorable opportunity for companies producing possible alternate materials to seek participation in subcommittee work," says Henderson. Hoped-for completion date: within three years.

J. D. Mattimore, of Tube Turns, stressed the need for standards in the

titanium pipe and fittings field. Next move: to decide whether specs can be written. First step will be taken by titanium-pipe and -fittings makers who will meet in New York Dec. 6 to take up the standardization cudgels. Because it is a new field, CIAB points out, it should be relatively easy to set standards now, before the industry becomes too complex.

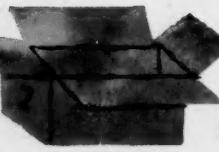
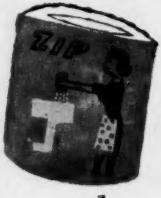
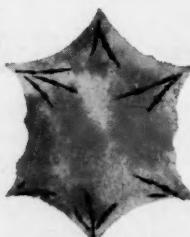
Also planning a New York meeting in December is an ASA subgroup on plastic fittings. Due for discussion: setting of strength ratings. Plastics, as materials of construction, will also come in for standards committee study soon.

Still unresolved is a proposal for CIAB to set up a full-fledged standards board (*CW*, Nov. 3, '56, p. 132). CIAB, which was formed at the request of the Manufacturing Chemists' Assn., is strictly an advisory group, wants to be empowered to supervise any proposed standardization. Charles E. Hilton, CIAB secretary, tells *CW*

*CIAB's secretary, Charles E. Hilton (left), Tennessee Eastman's Max B. Conviser, CIAB vice-chairman (right).

NOPCO DETERGENTS

for instance...

In paper,  by keeping felts clean, Nopco detergents  reduce shutdowns for cleaning equipment... *in textiles,*  they add important economies in raw wool and worsted processing, continuous boil-off operations... *makers of cleansers*  find in Nopco detergents a wide range of properties to produce everything from car washes to bubble baths... *in tanneries,* a  specially developed Nopco detergent removes excess grease from hides, produces better leather.

These are examples of the kind of problem Nopco's research men tackle...with a remarkable proportion of successes. It is always possible that they have recently solved *your* most critical problem. In any event, why not give them a try at it? They'll do their best to give you a practical, profitable answer—soon. Just write Technical Research Dept., Nopco Chemical Company, Harrison, N. J.

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For complete information see Chemical Materials Catalogue—Pages 373-376

PRODUCTION

the idea is "still under consideration."

Nuclear Emphasis: At the main ASA meeting—the Eighth National Conference on Standards—nuclear energy talks were featured for the second straight year. Main area of discussion: safety.

Donald E. Hull, of California Research Corp., in discussing control of radioactive isotope exposure, likened radiation injury to baldness—there seems to be no effective treatment for it. He illustrated effective methods used by refineries in preventing injury from external radiation through use of distance, time and shielding.

Level gauges in refinery vessels, utilizing gamma-ray sources of 100-200 millicuries of cobalt-60, have been used continuously in cracking plants at 1000 F for several years without incident. Aids in preventing injury: short exposure time through simpler, quicker operations; thicker shields than piston rings, lead shielding during plant maintenance shutdown; handling from a distance with a 7-ft. handle; use in the middle of a large vessel, a safe distance from the vessel's shell.

Use of radioactive catalyst beads to measure cat-cracker circulation rates raises a safety question—there is no way to recover the beads. Risk is calculated—only one bead in 10 billion is radioactive in the plant. And, says Hull, chances of overexposure are "infinitesimally small" and would, at worst, lop a few days off a 30-year life expectancy.

Time-Savers: At other sessions, Du Pont's Ralph A. Fuller and International Business Machine's John J. O'Farrell discussed time-saving standardization methods. Fuller told how Du Pont's "minimum adequate design" concept assists in freeing designers and draftsmen from many time-consuming activities through use of standards, elimination of unnecessary elaborations, and use of models and photography.

O'Farrell explained IBM's use of electronic data-processing machines to provide current standards data, establish sound standards and analyze the effectiveness of its standards program. Stressing the need to develop new standards more rapidly, he said that standards must be directed toward the needs of new development projects rather than the history of what has gone before.

The man who dusted off a bottle

On our return call, the Purchasing Agent still hadn't heard from his chemist. "Let's get the story," he said—and we went down to the lab.

The "story" wasn't so good. The plant chemist was up to his neck in work and unopened samples. "We're just too busy," he groaned, "we'll get to sample evaluation when we can."

We spotted our ACINTOL* sample and the P.A. picked it up. Our eyes bugged as he took out a spotless handkerchief and dusted it off. "This one's worth looking into, Jack. It'll lower costs and save us a lot of purchasing and production problems if it shapes up for our needs."

"Jack's overloaded, but I think he'll give your sample some action," the P.A. said. He tossed a now filthy handkerchief into his desk drawer. "Check back in a month."

We were back before the month was over—to thank him for an initial order. Seems the "handkerchief trick" had worked—our ACINTOL Fatty Acids sample had passed with flying colors.

Your own drying and semi-drying oil requirements are worth weighing against the performance and reaction versatility of ACINTOL Distilled Tall Oils and Fatty Acids. Consider, too, Arizona's unique position as the largest producer of tall oil products. Call on Arizona.

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ATLAS

CHEMICALS DIVISION

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Want help in making oil-water systems behave?

When you're developing emulsified products, you'll find that Atlas can lend you a hand in the specialized science of getting oil and water to cooperate. Manipulating oil-water systems has been a major part of our business for nearly 20 years . . . and it can probably help yours.

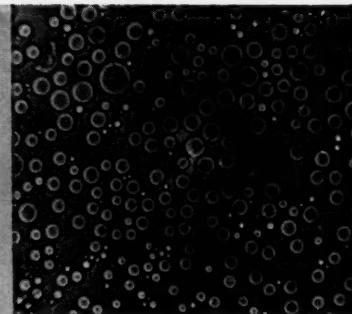
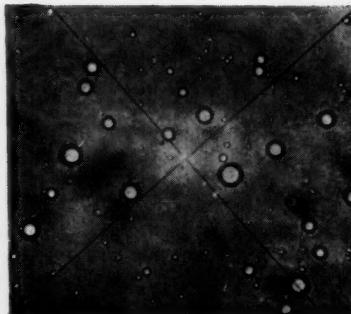
Finding the right emulsifier

One of the most important steps in putting an oil-water system together is to choose the emulsifier or blend that does the job best. This task is a lot easier when you use the HLB (Hydrophilic-Lipophile Balance) System developed by Atlas. The HLB System assigns numerical values to various surfactants as a measure of their affinity for water or oil. Similarly, each surfactant "job" has a measurable HLB value at which most satisfactory results are obtained. Instead of tediously trying every surfactant on the market, you can restrict your choice to those that give you HLB values required for your particular application.

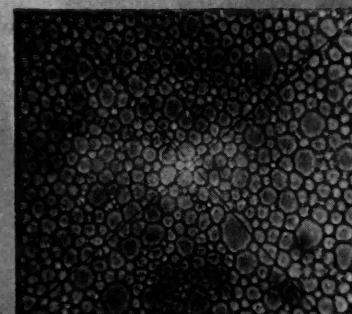
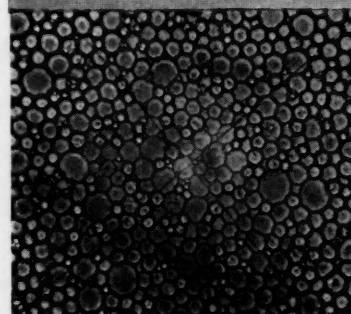
You're very likely to find the right emulsifier for your own formulation, in the hundreds of types that Atlas makes. They cover the gamut of oil-water mixing . . . surfactants, emulsifiers, solubilizers, detergents, penetrants, wetting agents.

Getting the desired stability

Usually you want an emulsion to stay emulsified. But often you also want to put ingredients in the emulsion that tend to make it fall apart. Acids and strong electrolytes are particularly difficult in this respect. However, if you use Atlas non-ionic emulsifiers, you can often include materials in your formula that you may have thought were impractical. And you can often eliminate separation due to freezing of a finished product. Sometimes you may prefer to have an emulsion that "breaks." We can usually tell you how to do this trick, too, by proper selection of emulsifiers and formulation methods.



Changing the viscosity of an emulsion is shown by this series of photomicrographs. Reading from left to right, they show what happens inside an emulsion as increasing amounts of oil are added to an oil-in-water emulsion. As more of the internal phase is added, the structure gets more crowded, and viscosity increases.



Controlling thickness

An emulsion can be made thicker or thinner by several techniques. To increase viscosity, for instance, you can increase the proportion of the internal phase, add thickeners, or include higher-melting materials in the internal phase. To decrease viscosity, you go the opposite way . . . use more external phase, use lower-melting components in the internal phase, or add more water-soluble (high HLB) emulsifier. We've had a lot of experience in this phase of formula development that will be useful to you.

Using the right production methods

Our experience can help you out in the plant, too. The tips that we can

give you on how to add oil, water and emulsifiers . . . how to agitate without introducing troublesome air entrapment . . . how to reduce milling by proper use of emulsifier blends . . . can frequently eliminate a lot of production worries for you.

Our lab will help you

You can cut your own research costs by letting our Development Laboratory help work out answers to your oil-water mixing problems. We can work on your complete formula, or on specific phases of it. Just write or call for a consultation. And get a copy of our Organic Chemicals Catalog, which lists the main classes of surfactants we make—or consult your copy of Chemical Materials Catalog for quick reference.

Chemical Week

Control your lab tests— and you'll get better emulsions



CONTROLLED AGITATION . . . The Atlab emulsion shaker, a development of Atlas research, assures reproducibility of tests. Both the shaker and the companion Atlab viewer are now available at moderate cost from the Arthur H. Thomas Company of Philadelphia.

Mannitol protects medicinals against moisture pick-up

Humid weather can be hard on water-sensitive medicinals in tablets . . . and using mannitol as the filler is an excellent way to help protect against this. Mannitol is one of the least hygroscopic of all carbohydrate excipients.

Mannitol is an isomer of sorbitol. It is crystalline, easy to store and handle. It's virtually inert toward active medicinals, doesn't cause chemical reduction . . . giving it wide compatibility, even with antibiotics and vitamins like B₁₂. Its low caloric value gives it an important edge where diets must be watched. Meets N.F. specifications. Write today for samples and data.



To help you get faster, more accurate evaluation of stability of emulsions, here are some tips for testing based on Atlas' long experience in developing and producing surface-active agents and aiding emulsifier users.

To get dependable test results, you need reproducible test conditions. Stability varies widely, even with the same formula, when the agitation of each sample is not *exactly* the same. Time is not the only factor in agitation—speed of shaking and length of stroke also cause stability variations. Don't trust your arm; do the shaking *mechanically*.

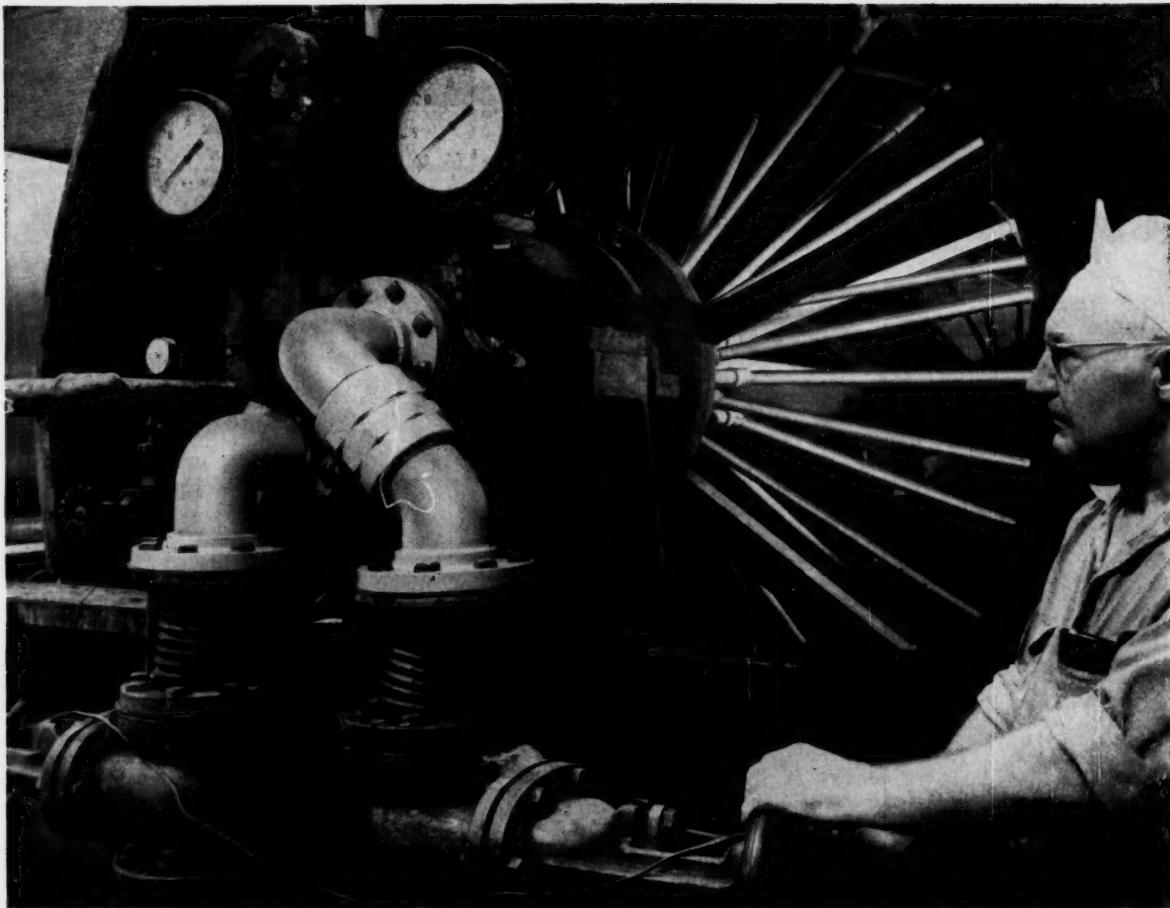
When liquid emulsions are being tested, viewing conditions are critical too. Transmitted light is best, requiring tubes $\frac{3}{4}$ to one inch in diameter, with thin walls to minimize reflection. Emulsion height in the tubes should be identical for best results. Avoid etched markings on the tubes, which can obscure separation lines.

To get utmost accuracy and reproducibility of tests in its own emulsion laboratory, Atlas has designed a motor-driven oscillating table with which time and speed of agitation, and length of stroke can be easily varied and rigidly controlled. Our chemists also developed a companion viewer which provides ideal conditions for quantitative evaluation of samples.

These aids to better testing are another reminder that you can count on Atlas for specialized help on your emulsion problems, as well as for quality surfactants for a wide range of applications.



USCOLITE PLASTIC PIPE



Pipeline of one of the Seven Wonders of American Engineering

Chicago's 403-million-dollar sewage disposal system every day processes 1200 million gallons of raw sewage. It's regarded by authorities as one of the seven engineering wonders of the nation.

Imagine the damaging effect on pipe of ferric chloride and other acidic chemicals used in the process! But this is not ordinary pipe in Chicago's great sewage disposal system. It is *Uscolite® Plastic Pipe*.

Uscolite Plastic Pipe was installed some eight years ago. Since then not a single leak has developed, not even a sign of weakness. The metal pipe it replaced had in some places been reduced to the thickness of a thumbnail!

The above rotary filter is but one of ninety-eight in the system. Each filter is 16 feet long, 11½ feet in diameter, contains 820 feet of 1" Uscolite Plastic Pipe and hundreds of Uscolite nozzles and additional fittings.

Uscolite Pipe and fittings are obtainable at our 28 District Sales Offices—each staffed with factory-trained engineers, at selected distributors, or write us at Rockefeller Center, New York 20, N.Y. In Canada, Dominion Rubber Co., Ltd.

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Mechanical Goods Division

United States Rubber

Technology Newsletter

CHEMICAL WEEK
November 30, 1957

Add the Three Bears to your missile-fuel lexicon. The Air Force is believed to be working on three projects known by the code names Baby Bear, Mama Bear and Papa Bear. Although they have had financial circles buzzing for several weeks, not too much is known about them. But that they aren't fictitious is attested to by a rather esoteric reference in *Cold Box* (an Air Products house organ) to "the Bear Series."

The best available information indicates that Project Baby Bear is a pilot-plant operation in Painesville, O., and that the other two are scaled-up versions at Cape Canaveral, Fla. Air Products and Linde are believed to have received \$100-million contracts for work on the projects.

Best guess is that they involve production of liquid hydrogen.

Hydrogen, of course, has long been recognized as a near-ideal propellant from many standpoints. For one thing, it would provide much higher thrust than some of the ultraenergy propellant systems currently being studied (*CW, Oct. 12, p. 148*). Its major drawbacks: because it's so light, it requires a large (though not necessarily heavy) system to contain it; and liquid hydrogen is nasty to handle.

Bureau of Standards scientists have been working on hydrogen-handling problems at the bureau's Boulder, Colo., cryogenic engineering laboratory. They recently reported a new technique that makes it easier—and less costly—to store and use liquid hydrogen. The trick: converting unstable orthohydrogen into the stable para form by catalysis with hydrous ferric oxide.

The Hawaiian Sugar Planters' Assn. electrodialysis unit for purifying sugar syrups will be shut down for several months, possibly until next July. Though the method has worked, the anion membranes used have been short-lived; replacement costs have distorted process economics.

Research is being stepped up, however, both at the planters' experimental station and in the labs of Ionics, Inc. (Cambridge, Mass.).

Newest twist in water conservation is a polyethylene-lined dam now being tested in Australia by Commonwealth Scientific and Industrial Research Organization. The leakproof liner for a 600-ft.-long, 80-ft.-wide experimental dam is made of Visqueen sheet. The plastic was laid across the dam in two large strips, joined together on the spot with new heat-sealing equipment developed by Plastalon Pty. Ltd. (Melbourne).

After it has been filled with water and tested for leaks, the dam will be utilized in the development of new techniques for controlling water losses by the Mansfield process of spreading cetyl alcohol on the surface.

Technology Newsletter

(Continued)

Can cermets and evaporative cooling break the thermal barrier?
According to Maj. V. Parfenov, of the Soviet Engineering Corps, Russian scientists have teamed the two to successfully withstand the tremendous heat generated in missile flights.

The cermet (the Russians call it a metalloceramic) developed for missile use is described as a regular ceramic, such as silica clay, containing 10-20% cobalt. Parfenov's reference to the application of this material in the body of a rocket indicates that it may be slated for use in intercontinental ballistic missiles, to resist the extreme temperatures generated by missile re-entry into the earth's atmosphere.

Evaporative cooling is being employed by the Soviets to protect the walls of combustion chambers and jet nozzles. The walls are porous, permit cooling liquid to be forced through under pressure.

You can expect to hear more about electrostatic precipitators for control of fluorine air pollution.

U.S. Steel has installed a \$9-million unit at its Provo, Utah, plant to eliminate fluoride emission from stacks at a sintering plant. Lime dust, injected into open-hearth furnaces, combines with the fluorine, permits it to be precipitated as calcium fluoride.

Kaiser Steel has been working on a similar problem for eight years at its Fontana Works. Kaiser recently came up with an electrostatic precipitation system that, it says, recovers up to 95% of the objectionable pollutants.

How the government's latest switch on 'spending cutbacks' (see Washington Newsletter, p. 45) will affect the Army Chemical Corps' research, production and development programs remains to be seen. But last week, in the face of an impending reduction of "several million dollars," this was the situation:

The phosphate development works at Sheffield, Ala., would be shut down; output of nerve gas at the Rocky Mountain Arsenal would have to be curtailed. Biological warfare development work at Pine Bluff Arsenal would also be cut back, and a major operation at Camp Detrick, Md., would be dropped completely.

However, there are indications that there will be more contracts to industry for development work on munitions delivery systems. The Chemical Corps has been given exclusive responsibility for the development and supply of incendiary rockets and chemical munitions for the popular 4.2-in. mortar. And there's a good chance the Chemical Corps will take over procurement of all chemicals for the Army. That would put a multimillion-dollar/year operation, involving thousands of different items, under centralized procurement.



if you're missing the green



A difficult "lie" can cost you a few dollars at the club house, but an obsolete plant in a crowded area can cost you a staggering amount in money and reduced efficiency.

Locate in The Land of Plenty, where there's plenty of room to meet present and future needs. Here you'll find many excellent sites with "room to grow," easily accessible to busy domestic markets — and foreign markets through nearby Port of Norfolk on famed Hampton Roads.

In this area are vast stores of mineral wealth — including the world's finest Bituminous Coal and top-grade limestone. There's plenty of water and power, an adequate supply of responsible, high-production workers, and dependable Norfolk and Western rail service. Add favorable tax rates, clean, progressive communities, and a host of other compelling industrial advantages, and you will understand why plants of all sizes are locating here in growing numbers.

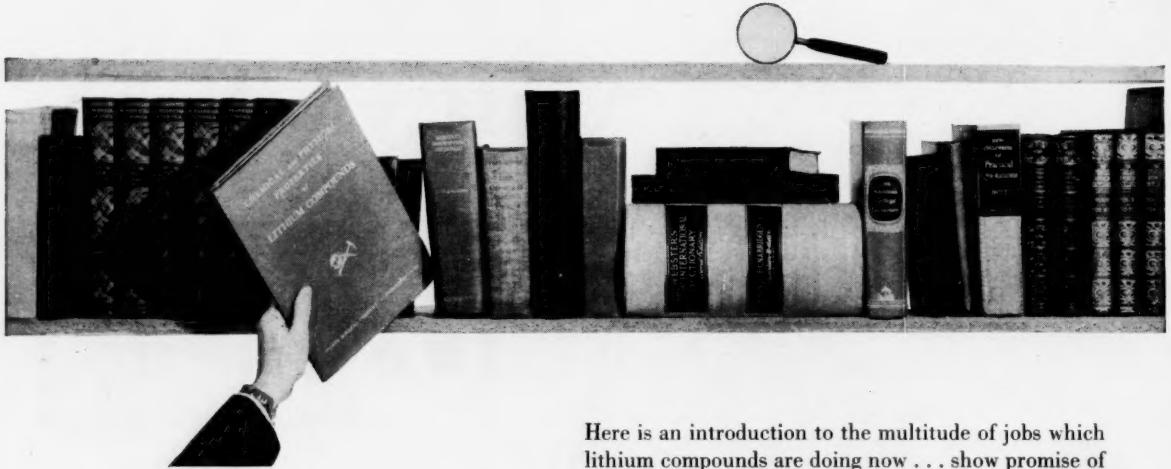
Get the facts on what this rich area can mean to *your* operation. Trained Norfolk and Western plant location specialists will be glad to work with you at any phase of your site-seeking. There's no obligation, and your confidence will be respected.

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A DICTIONARY OF USES FOR LITHIUM CHEMICALS

past . . . present . . . future

Here is an introduction to the multitude of jobs which lithium compounds are doing now . . . show promise of doing in the near future. Though there's no space for them here, there are further details . . . and they are available. Let us know which compound or which job you're interested in, and we'll send you whatever data Foote has relating to your field of interest. Write the Technical Literature Department, Foote Mineral Co., 420 Eighteen West Chelten Building, Phila. 44, Penna.

absorbent (CO₂): lithium hydroxide
air conditioning: lithium bromide; lithium chloride; lithium chromate; lithium molybdate
baths (heat treating): lithium fluoride; lithium chromate
battery (alkaline electrolyte): lithium hydroxide monohydrate
catalyst (crystal formation, esterification): lithium carbonate
catalyst (polymerization; reduction): lithium metal
ceramic (enamels, frits, glazes, etc.): lithium carbonate; lithium chloride; lithium fluoride; lithium nitrate
ceramic (raw material): lithium carbonate; lithium fluoride; lithium hydroxide monohydrate; lithium borate
coating (lens): lithium fluoride
coating (welding rod): lithium carbonate
conductivity* (increasing of electrolytes, fused salts): lithium chloride
coolant: lithium chloride; lithium metal
corrosion inhibitor: lithium bichromate dehydrate
cosmetics: lithium stearate
crystals (optical): lithium fluoride
dehumidifier: lithium chloride
de-icer: lithium chloride
dispersing agent: lithium citrate
dispersion stabilizer (deflocculant, ceramic): lithium citrate
electrolyte: lithium hydroxide
explosive*: lithium chlorate; lithium nitrate; lithium perchlorate
fillers* (rubbers, plastics): lithium aluminum silicate
flux (ceramic): lithium fluoride

flux (soldering): lithium borate
flux (welding and brazing): lithium chloride; lithium fluoride
freezing point depressant: lithium chloride
fuel*: lithium hydride; lithium metal
grease: lithium hydroxide monohydrate; lithium stearates
heat (transfer medium): lithium chloride; lithium metal
mud* (oil well drilling conditioner): lithium phosphate
nuclear material*: lithium metal
oxidizing agent*: lithium bichromate dehydrate; lithium chloride; lithium chromate; lithium perchlorate
pharmaceuticals (production of): lithium carbonate; lithium chloride; lithium citrate; lithium metal
plating reagent: lithium citrate; lithium cyanide; lithium hydroxide
pyrotechnics*: lithium chlorate; lithium nitrates; lithium perchlorate
reducing agent: lithium hydride; lithium aluminum hydride; lithium borohydride; lithium metal
scavenger (metallurgical): lithium metal
solder (silver): lithium metal
suspension stabilizer: lithium citrate

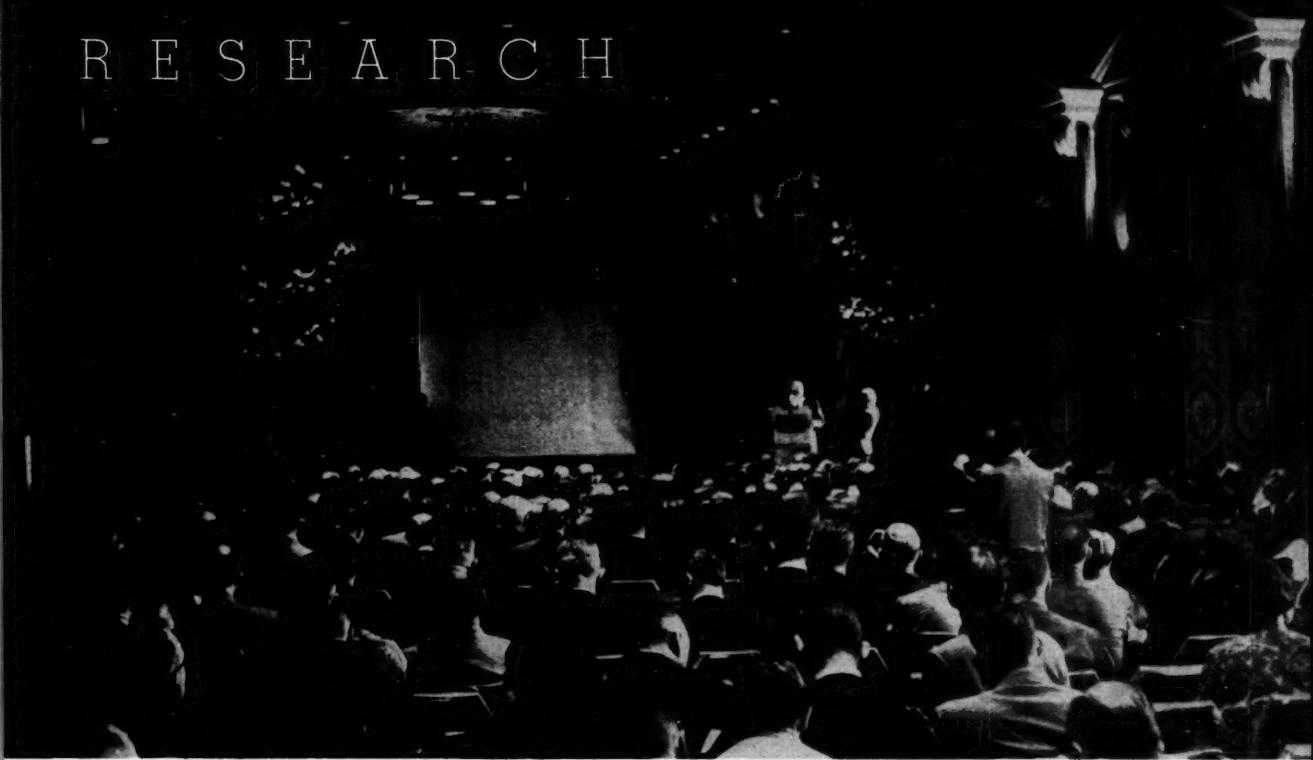
* You may very well be the *first* to take advantage of this potential use for lithium compounds.



RESEARCH LABORATORIES: Berwyn, Penna.
 PLANTS: Cold River, N. H.; Exton, Pa.; Kings Mountain, N.C.; Knoxville, Tenn.; Sunbright, Va.

LITHIUM CHEMICALS, MINERALS, METAL • STRONTIUM CHEMICALS • ELECTROLYTIC MANGANESE METAL • WELDING GRADE FERRO ALLOYS • STEEL ADDITIVES • COMMERCIAL MINERALS AND ORES • ZIRCONIUM, TITANIUM, HAFNIUM (IODIDE PROCESS)

RESEARCH



Symposiums at the Pasteur Fermentation Centennial attracted an audience of nearly a thousand . . .

Probing the Fermentation Chemical Future

Scientists who thronged the Waldorf-Astoria in New York at a special meeting last week heard predictions of big things to come from fermentation research. The occasion: the Pfizer-sponsored Pasteur Fermentation Centennial,* which also produced news of an antibiotic, kanamycin, that's potentially valuable against tuberculosis and acute infections.

Marvin Johnson, of the University of Wisconsin, sketched bright prospects for fermentation in chemical processing. Conceding that in the future "simple molecules will be made from petroleum rather than carbohydrate," Johnson showed how microbiological techniques could be used for the production of organic acids, the modification of complex molecules, even the creation of new compounds.

A primary application of fermentation processing could well be in the production of essential amino acids for animal feeds (and potentially for human food in overpopulated areas), but considerable work is yet to be done. Currently, DL-methionine, at \$2.40/lb., is about the only amino

acid cheap enough for feed use, and it is produced synthetically. L-lysine (\$12/lb.) is made by fermentation and synthetically, and it is still too costly for widespread use.

The relatively new use of microorganisms to modify existing compounds, Johnson believes, has great promise. Reason: chemical modification of a specific site in a complex molecule (by oxidation, reduction, etc.) is usually troublesome. Enzymes, on the other hand, are specific in their action. Limited knowledge is again a handicap; behavior of only a few organisms toward only a few compounds is presently known.

Fermentation will be yielding new compounds, too, but work hinges on improving culture-testing techniques. Also, the creation and testing of induced mutants of microorganisms should, Johnson believes, help increase fermentation chemical yields.

Another potentially profitable research area lies in development of ways to grow plant or animal cells by fermentation methods. As Johnson puts it, "If the many problems involved can be solved, it will be possible to grow plant cells as one would grow

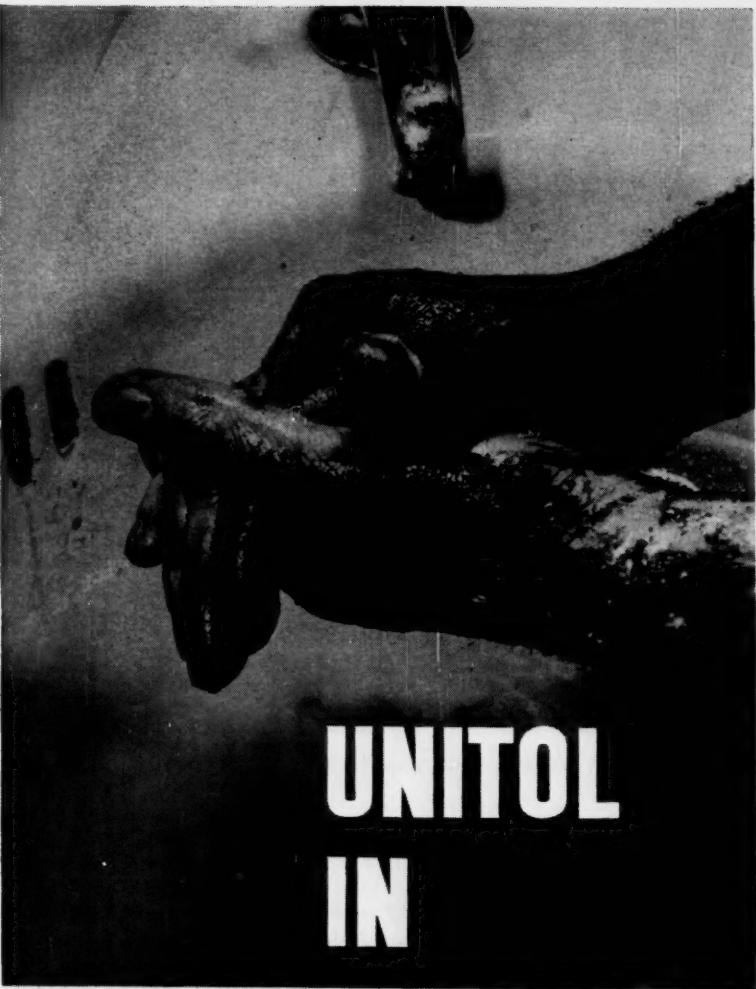
microbial cells. Many valuable compounds now obtained from plants, such as alkaloids, may be obtained by plant tissue culture. The problems in animal tissue culture are greater, but the possibilities of profitable gains in research are also greater."

New Roles for Antibiotics: Talking about current trends in antibiotic research, Paul Burkholder, of Brooklyn Botanic Garden (Brooklyn, N.Y.), called "outstanding" the surge in antibiotic production for other than pharmaceutical uses. Thanks to applications research, antibiotics are used in food preservation, against plant diseases and as animal growth stimulants. Conjectures Burkholder, "Perhaps if it were desirable, human fertility and growth rate could be increased by planned use of antibiotics."

Clinical problems that need (and are getting) research are allergies and toxicity associated with the drugs, the resistance of pathogenic microorganisms to drugs, and the overgrowth of secondary pathogens, especially fungi.

"Attempts to overcome these difficulties," he summarizes, "are found in the use of new and better antibi-

*It was in 1857 that Louis Pasteur discovered that living organisms cause fermentation.



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RESEARCH

otics, more effective combinations or good drugs, modified forms of drugs, different kinds of vehicles, adjuvants, and anti-allergens."

Need for More Antibiotics: Hamao Umezawa, of National Institute of Health of Japan (Tokyo), reported on his discovery, kanamycin. Umezawa, one of 18 conferees (from six countries) who attended the centennial sessions, goes along with Burkholder on the need for new antibiotics, tells *CW* the major research effort now is to find one that's effective against cancer. He has personally turned up 35 of some 350 antibiotics that have been scientifically described.

Kanamycin is obtained from a strain of *Streptomyces* isolated from Japanese soil, attacks both Gram-positive and Gram-negative bacteria. Bristol Laboratories, Inc. (Syracuse, N.Y.), currently owns an exclusive license on the drug, is making it for clinical trials. About a dozen group trials are now under way to check kanamycin's value against tuberculosis and acute infections (e.g., of the urinary tract).

Like many of his colleagues, Umezawa hopes antibiotics may be found to combat common virus infections. Success in this direction would probably mean a major increase in the antibiotics market, now about \$250 million/year for human therapy alone.

PRODUCTS

Derivatives: Air Reduction Chemical Co., division of Air Reduction Co. (New York), now offers methyl butenol and methyl hydroxy butanone in development quantities. They're derivatives of methyl butynol, are offered as intermediates useful in the synthesis of perfumes, food colors and flavors, pharmaceuticals and plastics.

•
Reagent Entry: Barium chloranilate, a new reagent for sulfate determinations, is now available from Fisher Scientific. Price: \$11.20/10 g.; \$23.55/25 g.

•
Alkyl Chlorides: 1-Chlorotetradecane and four other alkyl chlorides are now offered for evaluation by Henley & Co. Inc. (New York).

•
Crystal Aids: City Chemical Corp. (New York) now produces and distributes a series of pure chemical

Is Your Company Saving Money and Making a Better Product by Using AMSCO Solvents?



Check this list:

Hundreds of companies, scores of industries throughout the United States are saving time, saving money, improving their products, or increasing safety by using Amsco solvents.

The list of uses below, while far from complete, will give you an idea of the almost limitless ways in which these versatile solvents may be used. Whether or not your particular type of business is mentioned here, investigate what Amsco can do for you.

CHEMICALS—As ingredients in many chemical reactions and also as a raw material in the manufacture of some synthetic chemicals.

CLEANING—Used in preparation of detergents for commercial dry cleaning of fabrics and as spot removers; also as a cleaning solvent for textiles, metals and machine parts.

EXTRACTION—Most of the close boiling solvents are used as the extraction medium for fats, vegetable oils, glue, rosin, resins and other natural occurring products. Also as extraction solvent for production of certain pharmaceuticals.

GLUES, ADHESIVES—Used as a solvent for adhesive compounds and in production of industrial and decorative adhesive tapes.

INK—These have application as solvent in production of intaglio, heat set inks, printing inks, etc.

INSECTICIDES—Several are used as solvent and carrier for insecticides.



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OILCLOTH, ARTIFICIAL LEATHER AND COATED PRODUCTS—Applied as a solvent in the printing of table and floor oilcloth; also in the impregnation of various types of fabrics.

PAINT, VARNISH & LACQUERS—Used as solvent and thinner in manufacture of decorative and industrial paints, varnishes, lacquers and enamels. Also varnish removers and specialties.

PRINTING—Used as a general solvent and cleanser in printing plants for the cleaning of presses, plates and rollers.

RESIN—Amsco naphthas are used in the production of resin solutions including gloss oil.

RUBBER—Because of their qualities certain Amsco naphthas have application as a solvent in the preparation of rubber cements, rubber shoes, rubber dip goods. Also vital in the manufacture of rubber tires, both natural and synthetic.

TEXTILE—Amsco naphthas are used for cleansing fabrics and also for pad dyeing, printing and treating.

WAX & POLISH—Amsco naphthas are ingredients in many compositions of liquid and paste waxes and polishes, such as for floors, furniture, shoes, etc.

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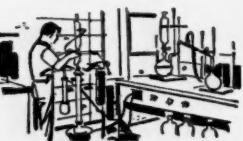
(Samples sent on request)

CHEMICAL RESEARCH and development

Laboratory facilities for sponsored research and development have undergone tremendous growth in recent years. Prominent in this area is Vitro Laboratories, which has undertaken many significant projects for industry and government.



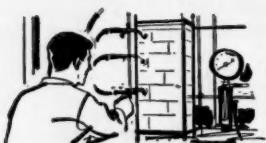
For instance, here are a few of the current fields of operation at Vitro's West Orange Laboratory:



COATING PROCESSES—including a novel technique for preparing specialty coatings, e. g., molybdenum on Inconel, wear-resistant lubricating coatings, metal-bonded abrasive structures, etc.



ORGANIC SYNTHESSES—including fundamental studies of new vinyl-type monomers and polymers, and organo-phosphorus and boron derivatives.



SEPARATIONS PROCESSING—including homogeneous reactor fuel processing, ion exchange, and adsorption and solvent extraction techniques.



NUCLEAR WASTE DISPOSAL—including development of disposal units, evaluation of current processes, and consideration of fission product utilization.

HIGH TEMPERATURE CHEMISTRY—including study of reaction kinetics and mechanisms at high temperatures (1200°C), pilot plant design and operation, and corrosion studies.

*Write for detailed information to VITRO LABORATORIES, West Orange, N. J.
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- ⚛ Nuclear and process engineering, design
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- Ⓐ Aircraft components and ordnance systems
- ⌚ Ceramic colors, pigments, and chemicals

RESEARCH

compounds used in growing crystals for semiconductor research. Included are potassium cobalticyanide, lanthanum ethyl sulfate.

Rugged Polyester: Sierracin Corp. (Los Angeles) is out with a plastic called Sierracin 880 that will resist to 300 F, retain its shape until charred. Suggested uses: airplane cockpit windows, medical equipment, special cameras.

Citraconic Anhydride: Now available from Chas. Pfizer & Co. (Brooklyn) in laboratory and pilot-plant quantities is citraconic anhydride, a low-molecular-weight liquid. The new entry may be used as a curing agent for epoxy resins, intermediate in synthesis of polyester resins.

EXPANSION

• Imperial Chemical Industries has just completed a \$750,000 isolation unit for breeding germ-free animals at its new research center in Alderley Park, Cheshire, England. The center employs 450, will be used for studies in both infectious and noninfectious diseases, anesthetics and sedatives.

• Atlas Powder Co. (Wilmington, Del.) recently established a toxicology section in its chemical research department. Object: to investigate the safety of handling, use and consumption of Atlas products.

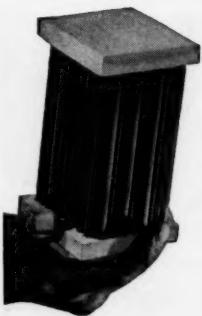
• National Aluminate Corp. (Chicago) has added a new \$1.5-million section to its administrative and laboratory facilities.

• Michigan Chrome and Chemical Co. (Detroit) has broken ground for a new research and development laboratory, which is scheduled for occupancy March 1, '58.

LITERATURE

• Properties of General Electric's Lexan polycarbonate resin (*CW*, April 6, p. 96) and other thermoplastic molding materials are compared in a new chart available from GE's chemical development department (Pittsfield, Mass.).

• "The Aerograph Research Notes," a new quarterly published by Wilkens Instrument & Research, Inc. (Walnut Creek, Calif.), discusses gas chromatography problems.



An important message to the man who thinks his air pollution problem is too difficult—or too expensive—to correct

Too often an air pollution problem exists today for one reason only: The company concerned does not yet know there is now at hand an efficient, effective method of correcting it—often at an actual saving through waste heat recovery.

The method is catalytic oxidation, and the firm that makes this development possible is Oxy-Catalyst, Inc.

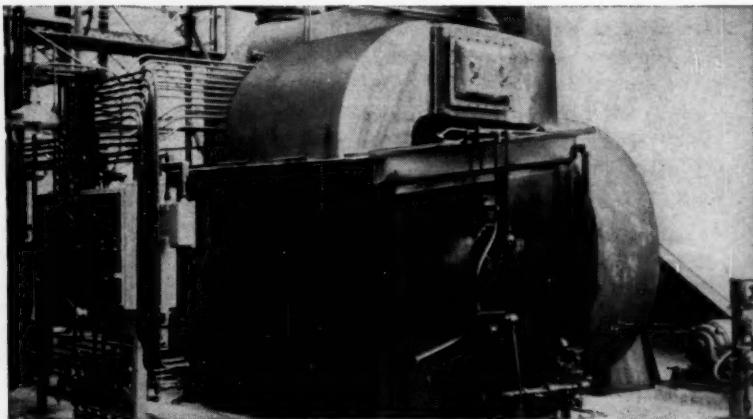
Catalytic oxidation works by "burning" harmful and irritating combustible contaminants in an exhaust stream at temperatures far below their normal ignition points. It provides close to 100% cleanup of foul-smelling fumes and odors. It reduces fire hazards and maintenance problems by eliminating troublesome condensates in oven and furnace exhausts.

Thus Oxy-Catalyst installations can not only control air pollution. They can also be used to release the latent heat energy in waste and process gases. And they can sometimes do both at once.

A More Efficient Catalyst

The key to successful catalytic oxidation is, of course, the catalyst itself. Features which make the Oxycat unique are:

- *The combination of platinum and alumina, chosen from hundreds of elements and compounds as the most active and long lasting catalytic agent*
- *The carrier, a high-grade porcelain selected for its strength, chemical inertness, and resistance to high temperatures*



Oxycat Installation on Standard Oil Company of California's phthalic anhydride unit at Richmond, Calif.

- *The patented method of applying the catalyst to the carrier*
- *The patented mechanical design of the Oxycat itself*

The result of this combination of features is a catalytic unit with exceptionally long life at high efficiency. Oxycats are strongly resistant to thermal shock—to contaminating agents and clogging. There's no problem of frequent cleaning or reprocessing. Oxy-Catalyst installations are still functioning at high initial efficiency after over 20,000 hours without maintenance or servicing.

Already in Wide Use

Oxy-Catalyst installations are now working effectively in a wide range of industries

—oxidizing combustibles from such processes as asphalt oxidation; phthalic anhydride, polyethylene and ethylene oxide manufacturing; catalytic cracking; and many others.

Oxy-Catalyst installations are carefully engineered to your individual requirements, and our engineers, working with yours, can install Oxycats effectively in any existing plant. So, if air pollution is a problem in your operation—if irritating fumes and odors are costing you neighborhood good will—you should know that Oxy-Catalyst offers a practical, realistic answer to your problem.

Fill in the coupon, or write on your business letterhead, for complete information now.

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Metallic Soaps (Cobalt, Manganese)	
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Nickel Nitrate	Nickel Sulfate
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Market Newsletter

CHEMICAL WEEK
November 30, 1957

How U. S. uranium concentrate output may be slowed down, as urged by AEC's Jesse C. Johnson (*CW Market Newsletter, Oct. 9*), is not yet certain. But unofficial comments by AEC officials at Grand Junction, Colo., now point up the possibilities.

Some mill contracts reportedly will not be renewed; in other cases, contracts up for renewal and extension will be "stretched out" over a longer period of time. Some mills will be requested to slow down their ore runs in return for an extended contract through 1962-66. There's hope that some imports from Canada might be diverted to Britain—thereby allowing more room for purchase of U. S.-produced concentrates.

Reaction to the proposed cutback, mainly from investors, is mixed. The man in the street—holder of penny uranium stocks—is dismayed at the disclosure of an oversupply of uranium for current government needs and for the slowly developing requirements of civilian nuclear power. Uranium stocks, already weakened in past months, dropped further in Salt Lake City as a result of the AEC announcement.

Reactions of professional investors vary according to personal interests. Operators of existing mills are inclined to applaud the cutback. Reason: U. S. expenditures for uranium concentrates in the next five years will still be immense (although subject to possible unfriendly Congressional review). But would-be operators, who are trying to get in on the uranium program, view the announcement with understandable gloom.

Vanadium purchases, too, will be curtailed by AEC, which will not renew vanadium purchases in new contracts with ore concentrators. AEC now buys vanadium concentrates from a half-dozen uranium mills. The plight of Colorado uranium-vanadium producers is underscored by the weakening price of vanadium on the open market. Last summer, for example, AEC's Grand Junction operations office offered vanadium for sale, elicited only two bids (53¢ and 78¢/lb.) for flake material.

Chemical process industries must promote synthetic textiles, and not depend on the textile industry to do it, according to Milton Harris, vice-president of Gillette Co. and president of Harris Research Laboratories. The reason, Harris last week told attendees of the American Assn. of Textile Chemists and Colorists convention in Boston, is that textile makers have little loyalty for certain synthetic fibers.

Right now, Harris added, textiles consume about \$2.3 billion worth of chemicals each year, and demand will increase if synthetic textiles are properly promoted by CPI.

That such promotion will not be easy was the implied warning to AATCC, by Arthur D. Little's president, Raymond Stevens. Textile

Market Newsletter

(Continued)

concerns, he said, face rigorous competition and narrow profit margins in the next few years. Some companies will drop by the wayside—the survivors will be those that can best merge technological skill with sound business practices.

Why there's a boom in cold remedies: New cases of acute upper respiratory diseases topped 63 million and involved 190 million bed-days of disability in the 17 weeks of July 1 to Oct. 26. So says U. S. Public Health Service, reporting results of its recently initiated national health survey. The survey was authorized by the 84th Congress to give drug and insurance companies, health agencies and other groups a continuing picture of the extent of illness and disability in the U. S. Data is gathered in regular biweekly interviews of some 700 households (with 2,200 persons), selected to provide a representative sample of the nation's civilian population. The figures include only persons bedded at least one day of the week by newly acquired acute respiratory infections.

Last week's report, giving cumulative results through Oct. 26, shows that new cases held at about 1,000/week through July and early August, rose to 4,500 in mid-September and then—with the flu season in full swing—bolted to a peak 12.2 million in the week ending Oct. 19. The following week saw a decline of 2.2 million. But survey statisticians, stifling a possibly premature cheer, cautiously note that "a variation of this magnitude could arise from sampling fluctuations" inherent in such a small national sample.

Vitamin and copper reductions feature this week's price news. The pyridine hydrochloride (B_6) cut, second this year, slashes the synthetic vitamin's tag down to \$245/kilo from the previous \$295 established in February. Prior to then the material sold at \$375/kilo.

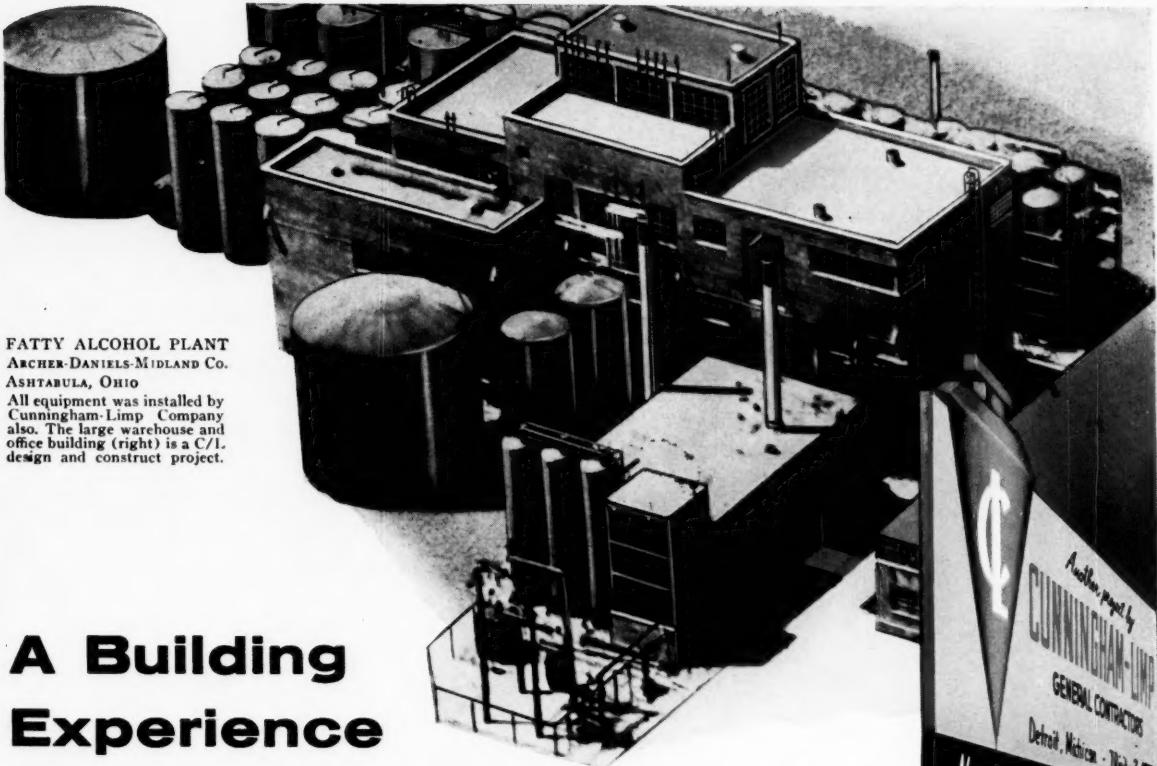
Domestic custom smelters last week nicked off another $\frac{1}{2}\text{¢}/\text{lb}$., bringing the price of their metal down to the $25\text{¢}/\text{lb}$. level of early September. The latest reduction wipes out the $1\text{¢}/\text{lb}$. increase smelters posted in mid-September (*CW Market Newsletter*, Sept. 21) when sales turned up slightly.

SELECTED PRICE CHANGES — WEEK ENDING NOVEMBER 25, 1957

DOWN

	Change	New Price
b-Carotene, pure, cryst., 1,600,000 to 1,670,000 A units, cns. dms., gram	\$0.06	\$0.29
Molasses, New Orleans, blackstrap, feed grade, tanks, gallon	0.005	0.11
Pyridoxine hydrochloride, bots., 100-gram lots, gram	0.05	0.245
Silver bullion, ingots, cs., Troy oz.	0.00125	0.9025
Tallow, edible, tanks, dlvd.	0.005	0.115
Tin metal (Straits)	0.025	0.8725

All prices per pound unless quantity is stated.



FATTY ALCOHOL PLANT
ARCHER-DANIELS-MIDLAND CO.
ASHTABULA, OHIO

All equipment was installed by Cunningham-Limp Company also. The large warehouse and office building (right) is a C/L design and construct project.

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budget for construction. Possession of it by C/L should certainly demonstrate to you that this company is fully capable of designing, engineering and building most any project you are planning—anywhere.

90% of C/L's business comes from repeat orders

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- Building construction, including
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 - Warehouses
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 - Chemical process plants
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 - Power plants
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 - Railroad and Utility facilities



Ask the owner on any project where you see this sign how he likes the way Cunningham-Limp does business.

* In the building business, especially, repeat orders indicate customer satisfaction. Listed here are several of the well-known corporations which have found it profitable to use C/L's design-engineer-build services at two or more "nationwide" locations. The complete list is available, of course.

ARCHER-DANIELS-MIDLAND CO.

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Mankato, Minn.
Wyandotte, Mich.

CHRYSLER CORPORATION

Detroit, Mich.
Rye, N. Y.
Skokie, Ill.

EX-CELL-O CORPORATION

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Lima, Ohio
*Birmingham, Mich.
*Indianapolis, Ind.
Lima, Ohio
Livonia, Mich.
Monroe, Mich.
*St. Louis, Mo.
Wayne, Mich.

STORER BROADCASTING CO.

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Birmingham, Ala.
Detroit, Mich.
Miami, Fla.

SUNSHINE BISCUITS, INC.

Detroit, Mich.
Grafton, Ohio
Jeffersonville, Ind.
Omaha, Nebr.
Pittsburgh, Pa.

*Designed by others

Send For The C/L Book—it you want 58 pages of help and information on building-engineering problems. It shows some cost-saving methods and many of the details that go into make wise building decisions. Request it on your business card or letterhead, please. It will be sent by mail.



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Three factors make it so. First, Gulf produces its own closely fractionated heptene feed stock. Second, the product is carefully quality-controlled throughout every step of its processing. And third, Gulf's pains-

taking research and unmatched experience in oxo-chemistry are your assurance of a product that's second to none.

You can get immediate delivery of Gulf Isooctyl Alcohol in tank cars from convenient shipping points at Port Arthur, Texas, Cincinnati and Philadelphia, and in tank trucks from Carteret, New Jersey. May we serve you? Call us today.

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Petrochemicals Department

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ADMINISTRATION



LIONEL CRAWFORD

RCI directors* keep a careful check on the changing supply of investor funds, a critical factor as . . .

Reichhold Readies Another Stock Issue

Amid talk this week of an expansion of business activity and a steady upswing in Wall Street—forecast as a possible result of the recent Federal Reserve Board's decision to permit a reduction in the discount rate—Reichhold Chemicals' directors (above) find themselves faced with a tough decision. Their problem: to determine the most financially advantageous time to place a once-postponed offering of 200,000 shares of RCI common stock.

The decision is made more difficult by the fact that RCI's last public offering, which was placed a year ago this month and which made the 30-year-old, White Plains, N. Y., firm partly publicly owned for the first time, netted \$4.2 million and was in some measure responsible for a gain in net profits of 47.6% this year over the first three quarters of '56.

Funds for Expansion: Expressing RCI management's confidence in the firm's future, Henry Reichhold, president and chief executive officer, told *CW* that the success of the first issue and the benefits derived from the proceeds give rise to expectations of

similar results from the pending offering.

The proposed new issue is expected to net more than \$4 million, of which \$3.5 million has been marked for capital expenditures. Of proceeds from last year's issue, approximately \$3 million financed capital spending.

Capital spending in '58—to be financed entirely with proceeds from the new issue—will include approximately \$1.3 million for expansion of existing—and construction of new—chemical production facilities at RCI's Elizabeth, N. J., plant (*table*, p. 78); approximately \$400,000 for expansion of resin and chemical production facilities at the Detroit, Mich., plant; nearly \$400,000 for expansion of chemical facilities at its Tuscaloosa, Ala., plant; and an undisclosed amount for a new 30-million-lbs./year formaldehyde plant and methanol terminal at Hampton, S.C. The new plant—RCI's 14th in the U.S.—is expected onstream in mid-'58.

Although some \$1.2 million of proceeds from the '56 stock offering went into working capital, RCI continues to have larger working capital requirements as a result of increasing sales. For that reason, the portion of

new proceeds not used for capital spending will go for working capital.

Over-the-Counter Trade: Reichhold stock is traded in the over-the-counter market. The range of stock quotations from the initial public offering date (Nov. 13, '56) through Oct. 23, '57, was 27 to 20 bid and 27 $\frac{1}{4}$ to 20 $\frac{1}{2}$ asked. The Oct. 23 range was 21 $\frac{1}{4}$ to 20 $\frac{1}{4}$ bid and 22 to 21 $\frac{1}{4}$ asked.

Prior to '56, RCI reinvested substantially all its earnings in manufacturing facilities. Since November '56, however, it has paid three quarterly common stock dividends of 15¢ cash and 1% stock per share. A fourth-quarter dividend of 20¢ cash and 2% stock per share, to be paid this month, was declared.

Reichhold, principal stockholder, has waived any cash dividends payable to him during the period from April '57, through March '61, on 750,000 shares owed him, but held by the company. He owns 803,446 (64.98%) of the corporation's outstanding stock and, together with other directors and officers of the firm, controls beneficially 843,627 (68.23%) of the common stock.

In addition, RCI directors and of-

*Clockwise: F. Grosius (back to camera), P. L. Swisher, F. A. Jolles, J. F. Goetz, A. G. Goetz, Reichhold, S. H. Baum and D. B. Tuson.

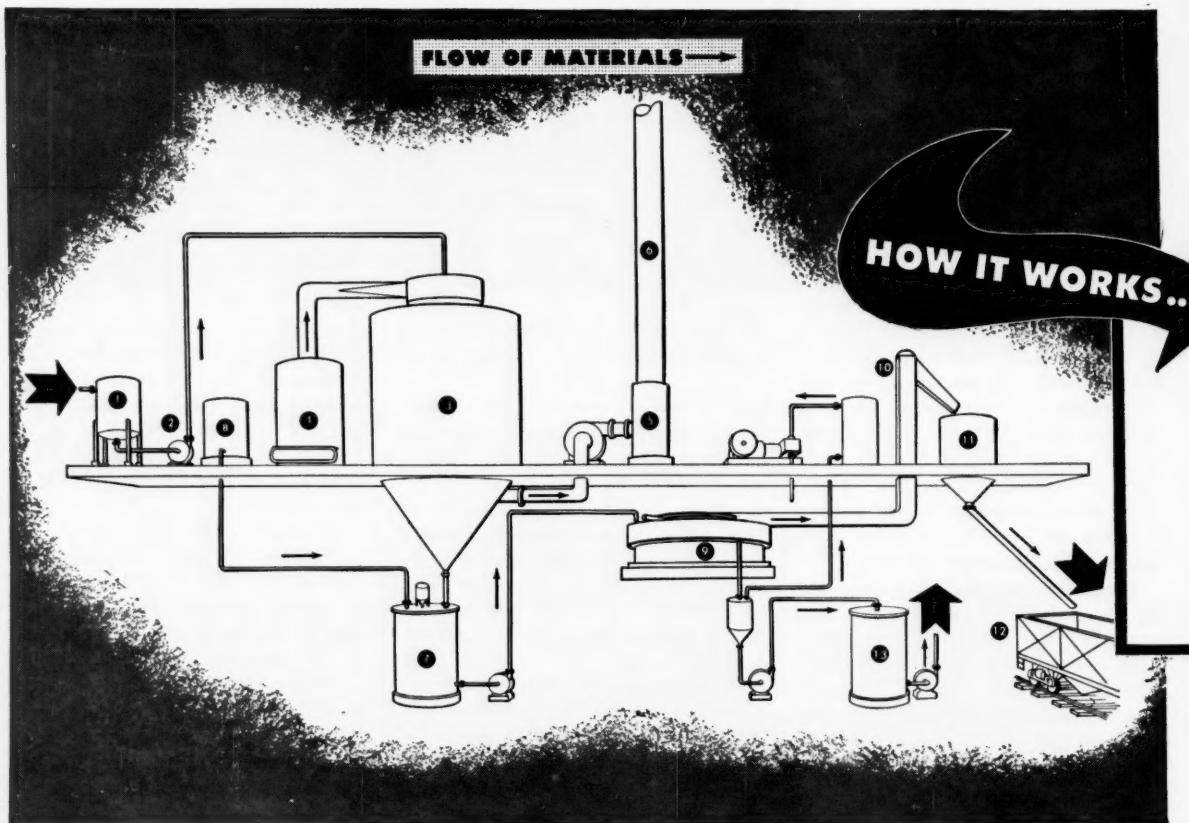


If you operate a CUT ACID REQUIREMENTS

New continuous process, available from Koppers,
of pickling acid used... and eliminates waste

FOR OVER A QUARTER OF A CENTURY, wherever a pickling line has been in operation, disposal of spent liquor has been a major headache. But now a new continuous regeneration process—the Koppers Inland-Zahn process—goes a long way toward solving this problem. This system is simple, it is economical, and *it has been proved in actual plant-scale commercial operation in Europe.*

With this process, the only make-up acid needed is the amount consumed in the pickling reaction plus normal losses. All available free acid in the used liquor is recovered (up to 50% of the original charge). Labor costs are low—just one man can operate the entire regeneration plant. As a result of these savings, operating costs are substantially below those of any presently available disposal method.



pickling line

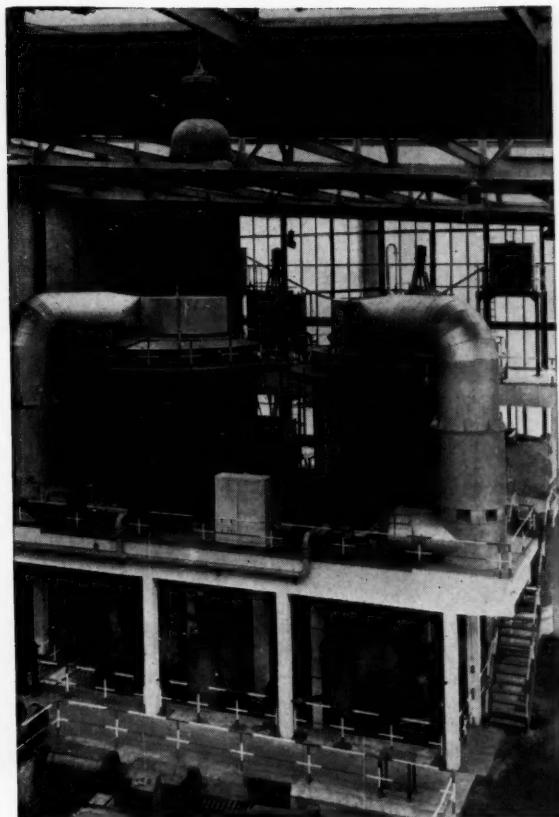
IN HALF!

**regenerates up to half
liquor disposal problem**

PROVED COMMERCIALLY—This process, developed by Inland Steel Company and adapted commercially by Zahn & Co. of West Germany, is now being used successfully in three European steel plants. The benefits achieved include *extremely low maintenance . . . and more uniform and higher acid concentrations in the baths. The latter advantage permits faster steel processing.*

NEUTRALIZING PLANTS — The new regeneration process is especially applicable to plants handling 10,000 gallons of effluent, or more, a day. The Chemical Department of Koppers Engineering and Construction Division also designs and builds lime neutralization systems for both large and small pickling operations. Send the coupon for complete information about these and other Koppers Chemical Engineering Services.

Spent pickle liquor (1) is pumped (2) to spray head in an evaporating chamber (3). Here, hot air and flue gases from a combustion chamber (4) concentrate the liquor and cause the ferrous sulfate monohydrate to crystallize out of solution. Vapor laden air is discharged to atmosphere through a mist eliminator and stack (5 and 6). The slurry is dropped into a crystallizing tank (7) where fresh sulfuric acid is added from a metering tank (8). This causes more monohydrate to drop out. The slurry is then separated in a vacuum filter (9) and washed. Salt is conveyed to bins or hopper cars for sale or disposal (10, 11, 12). Mother liquor, containing about 35% acid and 1-2% iron, is pumped to a holding tank (13), ready for dilution and return to the pickling tanks. No reheating is required.



HEART OF THE SYSTEM—This spray dryer concentrates spent liquor to slurry of ferrous sulfate monohydrate crystals suspended in acid. The plant shown here, in Germany, has operated since June, 1954, processing 48,000 gallons per day of waste liquor.

GET ALL THE FACTS!

Koppers Company, Inc.
Engineering and Construction Division
1453 Koppers Building
Pittsburgh 19, Pennsylvania

I would like to receive literature on this new pickle liquor regeneration process . . . and also on Koppers other chemical engineering services. Please send the following:

- Regeneration of steel pickling solutions by Koppers Inland-Zahn process.
- Lime neutralization of spent pickle liquor by Koppers.
- "3 Keys to Selecting Your Industrial Contractor," a brochure describing the variety of Koppers construction services and giving reasons why Koppers should build your next chemical plant.

Name _____

Title _____

Firm _____

Address _____

City _____ State _____



KOPPERS
CHEMICAL ENGINEERING SERVICES



ELECTRICAL PROPERTIES

...in phenolic resins

The electrical resistor is in essence a simple, compact device with the obvious function of providing resistance in an electrical circuit. But its makeup can have very interesting implications if you are faced with problems that call for bonding, coating, or adhesive agents.

The familiar type of fixed resistor you see here uses carbon composition element insulated and protected from moisture by a phenolic sleeve. It can do its job properly only so long as its resistance rating is held within the small tolerances allowed in electrical and electronic work. For this, manufacturers rely on the insulating characteristics of Durez phenolic

resins—their moisture resistance and their stability under varying conditions of heat and humidity.

The electrical characteristics of Durez resins are combined with mechanical and chemical properties which make them widely useful in industry. Current applications range all the way from shell molds for metal castings, to dense, strong board manufactured from sawdust or wood particles, to mortars and cements used for bonding acid-proof brick.

As pioneers in developing phenolic resins, may we suggest that their versatility may hold the solution to problems in your operations? Our long experience is at your service.

DUREZ

® Phenolic Resins that Fit the Job

DUREZ PLASTICS DIVISION

HOOKER ELECTROCHEMICAL COMPANY

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Export Agent: Omni Products Corp., 460 Fourth Avenue, New York 16, New York

HOOKER
CHEMICALS
PLASTICS

ADMINISTRATION

ficers as a group own beneficially approximately 7,766 (9.70%) of the voting securities of Reichhold-Beckacite S.A. (French subsidiary) and 21,925 shares (24.70%) of the voting securities of Reichhold Chemicals (Canada) Ltd.

Needed More Money: Listing his reasons for the first public offering of his company's stock, Reichhold

The Reichhold Network

Argo, Ill.

specialty chemicals

Azusa, Calif.

surface-coating, epoxy and polyester resins, and phenol- and urea-formaldehyde resins

Ballardvale, Mass.

urea- and phenol-formaldehyde resins, formaldehyde, miscellaneous chemicals

Brooklyn, N.Y.

inorganic color pigments

Charlotte, N.C.

urea-formaldehyde resins, formaldehyde, vinyl emulsions

Ferndale (Detroit), Mich.

surface-coating resins, phenol- and urea-formaldehyde resins, polyesters, phthalic anhydride, plasticizers, refining glycerine

Elizabeth, N.J.

surface-coating resins, phenol- and urea-formaldehyde resins, maleic anhydride, phenol-modified resin products, special resins, plasticizers

Jacksonville, Fla.

urea-formaldehyde resins

Kansas City, Kan.

phenol-formaldehyde resins

Seattle, Wash.

phenol- and urea-formaldehyde resins, pentachlorophenol, formaldehyde

South San Francisco, Calif.

surface-coating resins, phenol- and urea-formaldehyde resins, protein glues, phenol-modified resin products, plasticizers

Tacoma, Wash.

pentachlorophenol, phenol- and urea-formaldehyde resins, protein glues, hydrochloric acid, formaldehyde

Tuscaloosa, Ala.

phenol, orthophenylphenol, pentaerythritol, formaldehyde, sulfuric acid, surface-coating resins, phenol- and urea-formaldehyde resins, sodium sulfite

Note: RCI also owns 58.9% to 100% of the voting stock of six subsidiaries, in Canada (three), France, Switzerland and Mexico; and less than 50% of six subsidiaries in Argentina, Australia, Brazil (two), England and Japan. The company has licensing agreements with concerns in Germany, Holland, Italy, South Africa and the Philippines (CW, June 15, p. 67).

**send for your
copies of these
BLOCKSON**

Data Sheets

they're yours for the asking

A separate product bulletin is now available for each BLOCKSON chemical listed below. Bulletins provide required data on formulas, properties, applications, grades, containers, etc. All essential information is concisely presented for ready reference.

Sodium Tripoly Phosphate	Tetrasodium Pyrophosphate	Trisodium Phosphate Crystalline • Monohydrate	Sulfuric Acid
Sodium Polyphos (Sodium Hexametaphosphate) (Sodium Tetraphosphate)	Tetrapotassium Pyrophosphate		
Dihydrogen Phosphate	Hygrade Fertilizer		
Disodium Phosphate	Tri-sodium Phosphate Chlorinated		
Hydrofluoric Acid	Sodium Silicofluoride Sodium Fluoride		
Sodium Acid Pyrophosphate	C-29 Sequestering Agent	Teox 120 (Nonionic Surfactant)	

MARK AND MAIL THIS LIST

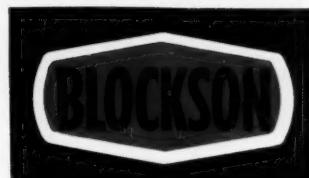
- Sodium Tripoly Phosphate
- Tetrasodium Pyrophosphate
- Trisodium Phosphate Crystalline • Monohydrate
- Trisodium Phosphate Chlorinated
- Disodium Phosphate Crystalline • Anhydrous
- Monosodium Phosphate
- Monosodium Phosphate Anhydrous • Monohydrate
- Sodium Polyphos*
- Sodium Acid Pyrophosphate
- Tetrapotassium Pyrophosphate
- Sodium Fluoride
- Sodium Silicofluoride
- Hygrade Fertilizer
- C-29 Sequestering Agent
- Teox 120 (Nonionic Surfactant)
- Hydrofluoric Acid
- Sulfuric Acid

*Sodium Hexametaphosphate - Sodium Tetraphosphate

BLOCKSON CHEMICAL COMPANY • Joliet, Ill.

Division of Olin Mathieson Chemical Corporation

WAREHOUSE STOCKS AT ALL BLOCKSON DISTRIBUTORS



New Wyandotte chart helps you choose between 50% and 74% caustic soda

Like to make a definite decision whether or not switching from 50% to 74% caustic soda would be profitable for your business?

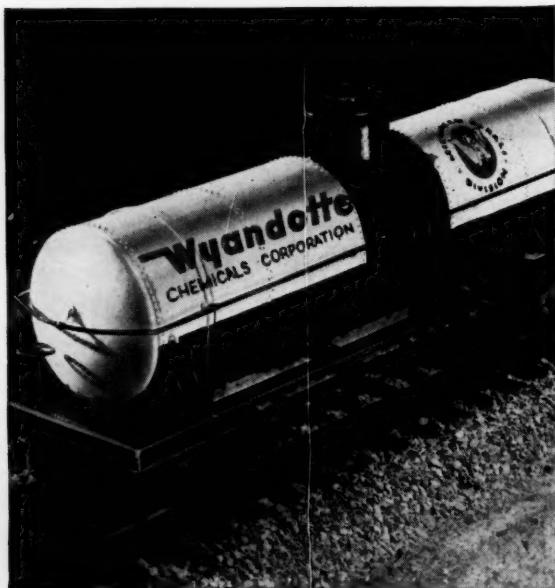
To make this task easier for you, Wyandotte has devised a unique chart which helps you plot your economic position, and shows you whether switching from 50% to 74% liquid-caustic solutions can benefit you in your operations.

In choosing, there are many variable factors which you must consider: the cost of concentration; end use of the caustic soda; existing storage and handling facilities; quantity of caustic consumed; plant location.

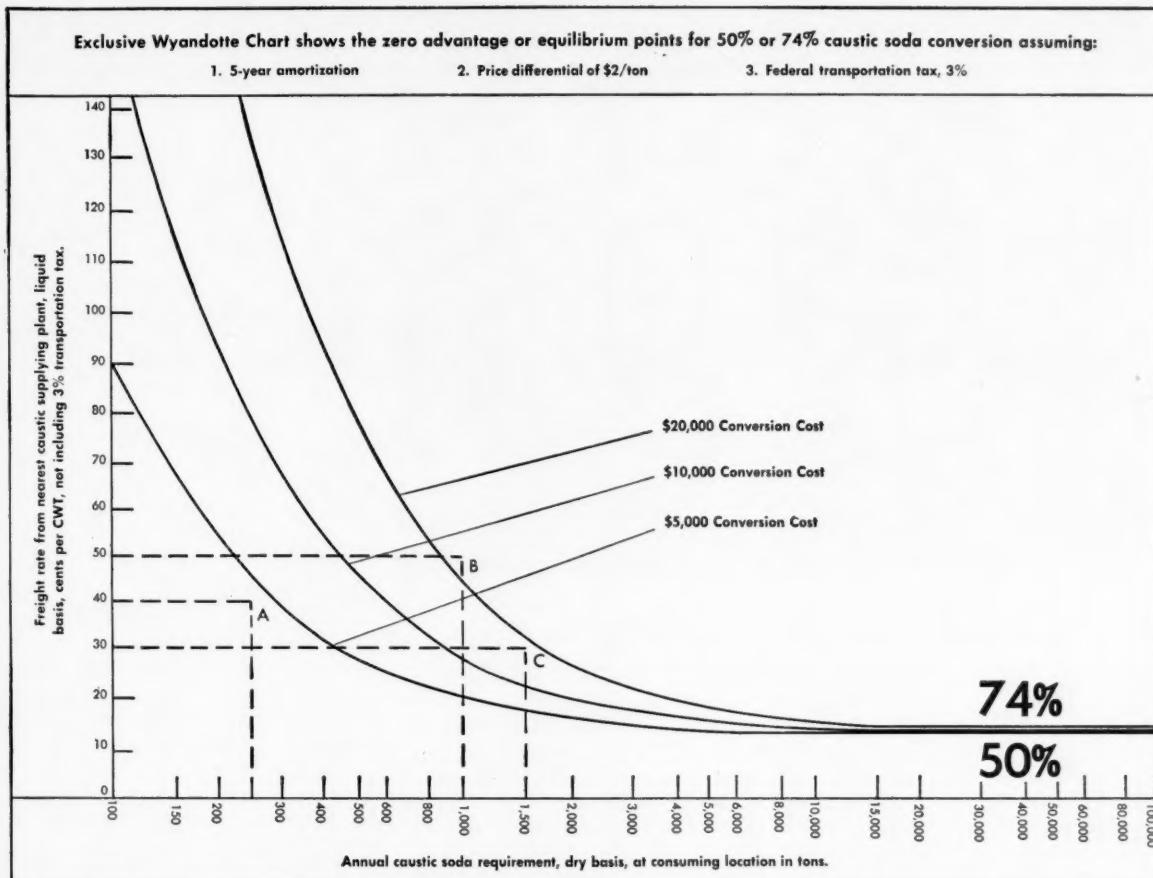
While there are definite freight savings to be realized from using 74% caustic (less water must be shipped), if the final use of the caustic requires a dilute solution, equipment must be provided to dilute the tank car of 74% liquor. And since the dilution operation results in approximately 70% more total liquid, additional storage space may be needed.

A survey of your operations will reveal the possible savings that may be made by switching to 74% liquid caustic. Even though you may have surveyed operations previously, increased use of caustic or changes in freight rates may well mean you can save money now by switching to 74% liquor . . . it is wise to plan periodic surveys of your caustic requirements.

Our technical service representatives are experienced in solving problems concerning the type of caustic soda to be used, and will gladly aid you in making the necessary economic studies. For further information and help in choosing which is best for your business, get in touch with us today. *Wyandotte Chemicals Corporation, Dept. 565, Wyandotte, Michigan. Offices in principal cities.*



Wyandotte's caustic liquor is loaded while hot. This heat, plus heavy insulation, insures users against solidification.



HOW TO USE CHART

EXAMPLE A: Freight from nearest producing point to consuming point is 40 cents per hundredweight. Annual consumption by consuming plant is 250 tons caustic soda, dry basis.

ANSWER: Because Point A lies to the left of the curves, the plant should purchase caustic soda as a 50% liquid.

EXAMPLE B: Freight from nearest producing point to consuming point is 50 cents per hundredweight. Annual consumption by consuming plant is 1000 tons caustic soda, dry basis.

ANSWER: Because Point B lies to the right of the curves, the plant should purchase caustic soda as a 74% liquid, even though additional equipment investment of as much as \$20,000 might be found necessary.

EXAMPLE C: Freight from nearest producing point to consuming point is 30 cents per hundredweight. Annual consumption by consuming plant is 1500 tons caustic soda, dry basis.

ANSWER: Because Point C lies between the \$10,000 curve and the \$20,000 curve, the plant should purchase 50% caustic soda if the additional investment necessary exceeds about \$15,000, or should purchase 74% caustic soda if the additional investment is less than about \$15,000.

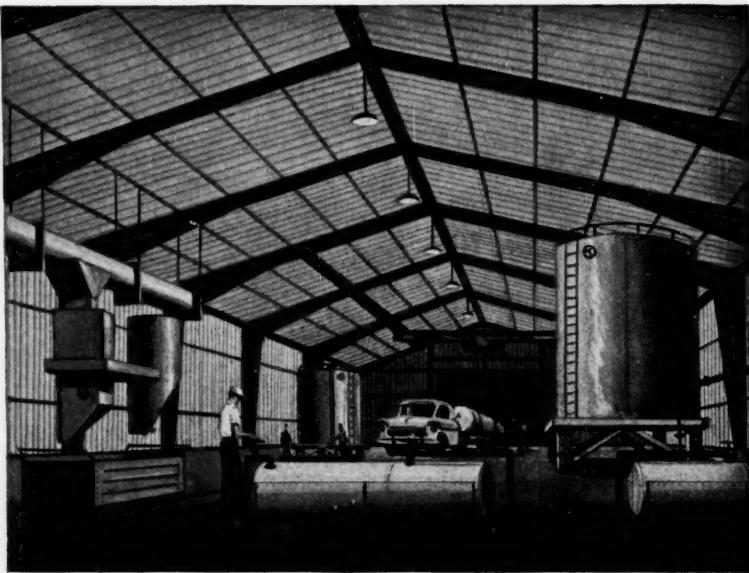
NOTE: The amount of additional investment needed is based primarily on how much of the following items are presently part of the caustic soda unloading, storage and handling facilities at the consuming plant:

1. Storage capacity: A 10,000-gal. tank car of 74% caustic soda produces about 17,000 gals. of 50% liquor.
2. Dilution facilities: Water pump, caustic-soda pump, line-temperature gauges necessary to dilute 74% to 50%.
3. Cooling facilities: The hot 50% caustic soda must be cooled to about 110°F.-120°F. prior to storing the 50%.
4. Contamination: Some consuming plants would need protective linings or materials in the equipment to prevent contamination; thus, all-nickel equipment might be needed in some cases.

Wyandotte CHEMICALS
MICHIGAN ALKALI DIVISION



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CALCIUM CARBONATE • CALCIUM CHLORIDE • GLYCOLS • CHLORINATED SOLVENTS
SYNTHETIC DETERGENTS • OTHER ORGANIC AND INORGANIC CHEMICALS



Chemical men get rugged clear-span design, attractive **Stran-Satin** walls with NEW STRAN-STEEL BUILDINGS

The open, clear-span design of Stran-Steel buildings makes them ideal for the large tanks, vats, and associated piping required for chemical processing operations. In addition, new Stran-Steel buildings have a look of quality never before achieved in an all-steel structure.

Start with the smart *Stran-Satin* finish. *Stran-Satin* metal wall, exclusive with Stran-Steel, provides a strong, durable exterior with the weather resistance of zinc-coated steel. Special protective coatings are available for extreme corrosive conditions. Peaks, gables and eaves are completely enclosed with smart fascia flashing.

Under this attractive exterior is a rugged steel structure. At the peak and knee, the continuously welded rigid frame I-section steel plate beams are securely bolted together. Each frame is also permanently bolted to the foundation.

New Stran-Steel buildings are quickly erected at minimum cost, provide clear, unobstructed space for large equipment, and may be provided

with such required accessories as overhead craneways or large access doors. With Stran-Steel buildings, you get the cost-saving features of a pre-engineered structure in a quality building that is fire-safe and easy to insulate. They are available in widths of 32, 40, 50, 60, 70, and 80 feet, and multiples thereof.

Up to \$25,000 is available to finance these buildings through the Stran-Steel Purchase Plan. As little as 25% initial investment; up to 5 years to pay. Ask your Stran-Steel dealer for the complete story. He is listed in your classified telephone directory.

Dept. 24-25



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Chicago 6, Ill., 205 W. Wacker Dr.
Cleveland 16, Ohio, 20950 Center Ridge Rd.
Detroit 29, Mich., Tecumseh Rd.
Houston 5, Texas, 2444 Times Blvd.
Kansas City, Mo., 6 East 11th St.
Minneapolis 4, Minn., 708 S. 10th St.
New York 17, N.Y., 405 Lexington Ave.
San Francisco 3, Cal., 1707 Central Tower Bldg.
Washington 6, D.C., 1025 Connecticut Ave., N.W.

Stran-Steel Corporation, Detroit 29, Michigan, Dept. 24-25

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 Please have your representative call.

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Title _____

Company _____

Address _____

City _____

Zone _____ State _____

ADMINISTRATION

said the firm simply needed more money for expansion than it could earn. The question was debated for a number of years. "First, we had to prove ourselves as a successful company," Reichhold said.

Because of taxes, retained earnings were getting so small, Reichhold explained, the company had to get money elsewhere. "Our expansion was the kind that had to be done, regardless of market conditions."

The company's substantial growth and record profits during the first nine months of this year is attributed by RCI management to several factors in addition to the \$4.2 million, including:

- Spectacular growth of the resins business to a significant position in the chemical industry.
- RCI's decentralization of plants—begun several years ago—to help supply customers faster and at less cost.
- Limiting the firm's business to plastics, resins and basic chemicals.
- Organizationally putting the corporate "house" in shape.
- Providing needed facilities and bulk raw materials by putting money into expansion and working capital.

Chemical Sales Efforts: H. W. Duval, sales manager of RCI's chemical division, shares Reichhold's bullish attitude about the future; and as part of the company's recent growth picture, he points to division sales of \$15 million for the first nine months of '57—a 31.5% increase over the same period in '56.

"Since November '56," he points out, "our salesmen have known they would have definite basic chemical capacity to depend on, and as a result they can sell with confidence. Also, the chemical division now has a policy of encouraging salesmen to sell the firm's chemical products."

Plans, Duval says, call for the chemical division—which accounts for 20% of RCI's business—to hike sales a minimum of 30% in '58, 25% in '59. The leveling off will be due to company sales policy and the supply of chemicals.

Henry Reichhold admits that "going public" meant certain problems of adjustment for him, but he doesn't regret the change. "For one thing," he said, "corporate flexibility hasn't decreased as I was afraid it would. And as far as control of the company is

AEROSOL® 22

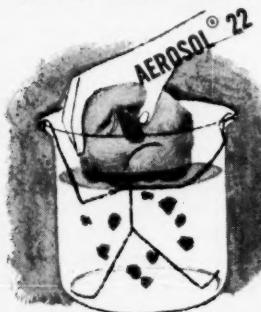
Surface Active Agent

DELIVERS The Promise of an Unusual Surfactant Molecule!

AEROSOL 22 is unsurpassed or unequaled in performance by other commercial surface active agents in the many important respects detailed below. These outstanding properties are a result of a highly active molecular structure that combines a sodium sulfonate and three sodium carboxy groups with an amide linkage and an 18-carbon aliphatic. In spite of a molecular weight of 653, it is completely soluble in water—yet its hydrophobic properties are maintained in high-temperature ranges where many surfactants lose their effectiveness. This molecular "powerhouse" promises unusually good results—and delivers them in a wide variety of applications.

Solubilizing the "Insolubles"

AEROSOL 22 goes well beyond emulsification in putting certain compounds that are normally allergic to water into stable "solutions." It

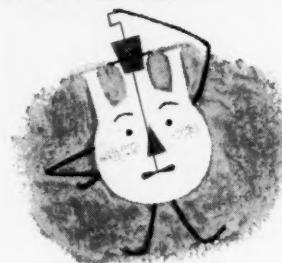


will also increase the solubility of certain soaps and detergents in aqueous media containing high salt concentrations. It is almost impossible to "salt out" AEROSOL 22 from its aqueous solutions by adding salts containing monovalent cations—and this stability to electrolytes is largely passed on to the materials it takes into solution. For example, high molecular weight naphthenic and cresylic acids are made soluble in 25% caustic soda.

Emulsion Polymerization Made Easy!

In this popular polymerization technique, much depends on the proper choice of surface active agent for a particular monomer system to assure:

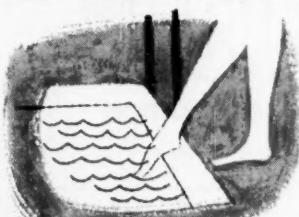
1. Rapid reaction rate.
2. Storage stability with no drop in surface tension—no viscosity increase.
3. No rewetting or water-spotting of dried coatings or films.
4. Excellent rub stability.
5. Good film color.



Here is where the all-round characteristics of AEROSOL 22 combine to do an excellent job, satisfying the list above—and more. Lots of up-to-date information on this rapidly expanding production technique is available through your Cyanamid representative. Perhaps you'll be interested in the synergistic action of other AEROSOL surface active agents used in conjunction with AEROSOL 22 to give even higher levels of polymerization performance.

Wetting...to a Degree

The surface tension of water to which 0.1 to 2.0% AEROSOL 22 has been added varies from 40-41 dynes only. This controlled wetting action is particularly good for writing and drawing inks since the degree of wetting is not significantly affected by the evaporation or dilution these inks undergo. In rug and upholstery cleaners, AEROSOL 22 does not wet through and soak the material, but



instead contributes to thorough on-the-surface cleaning. Wherever wetting is to be kept within bounds, AEROSOL 22 is worth investigation.

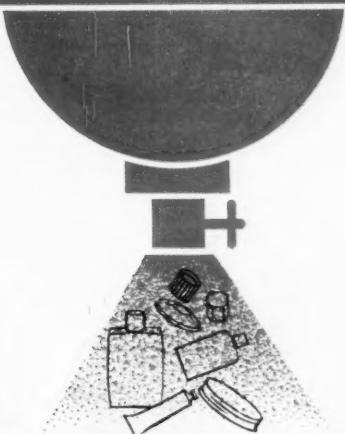
Sorry...

We haven't space to discuss in detail the anti-gelling, demulsification, dispersion and other characteristics. But they're detailed in a 20-page booklet—and the coupon on the right will bring it to you.

SURFACE ACTIVE AGENTS

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ADMINISTRATION

concerned, there's no danger of losing control if you have good management, even though you own less stock."

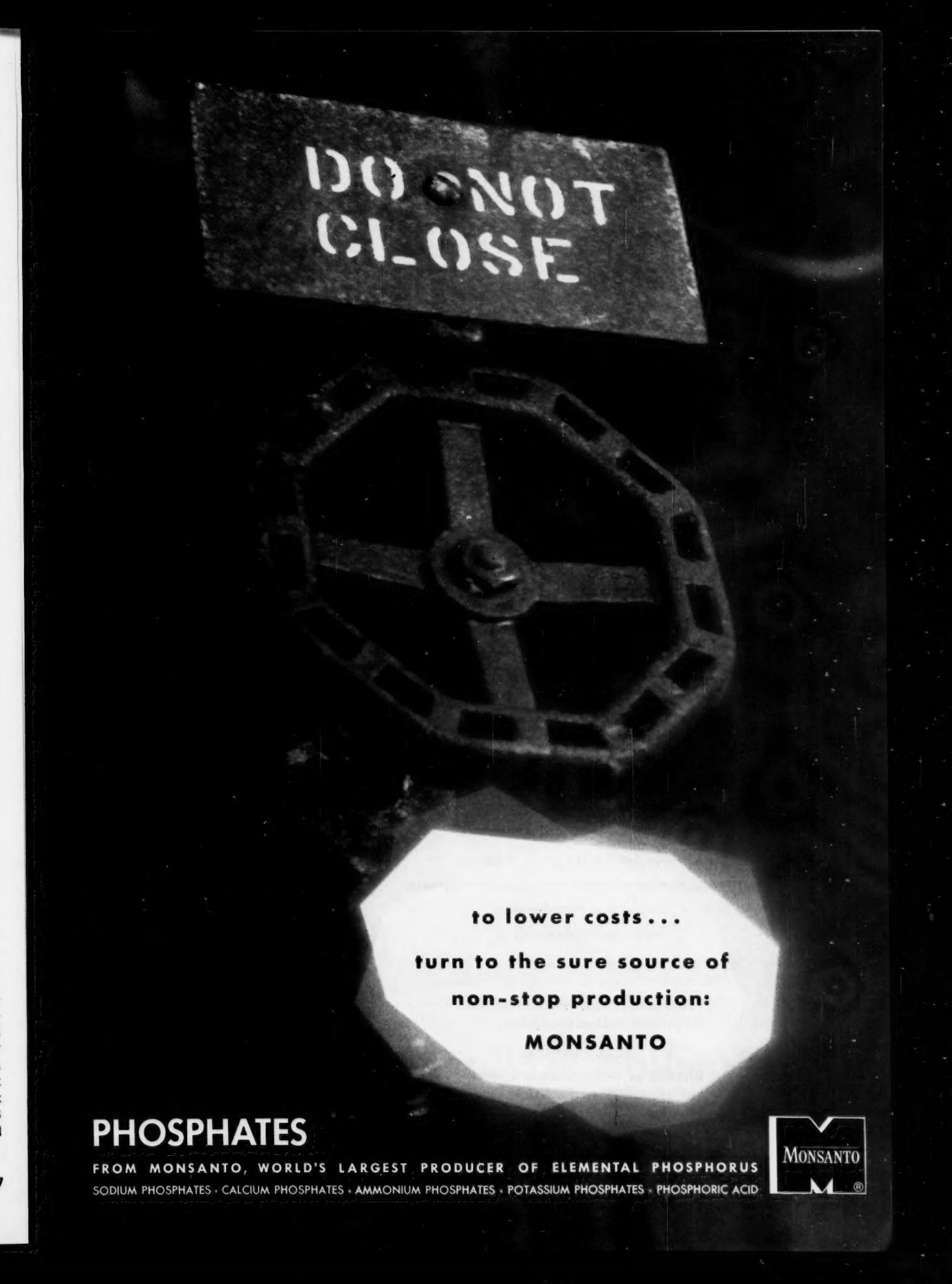
Concerning the company's success during its first year as a public corporation, there's no argument. Big question in the minds of RCI management and stockholders—and a watching industry—is, "Will the next year and a second stock offering bring the same spectacular results?"

IDEAS

Corporate Life: The stereotype of the "corporation man" is as patently false as that of the absent-minded professor or the long-haired scientist, according to Du Pont's view in a newly published 32-page illustrated booklet, "The Story of Life in a Large Corporation." The booklet—designed to show stockholders and employees that corporation employees and owners are "just like anyone else"—points out that the 500 largest U.S. corporations alone employ nearly 9 million people, and that a total of perhaps 35 million are directly dependent upon paychecks from these corporations.

Office Christmas Parties: Odds are almost three to two that your company will have an office Christmas party this year, according to a survey of 1,000 business concerns across the nation, and it's quite likely that the company will foot the entire bill. These facts and others are revealed in a survey, begun shortly after the '56 Christmas season, by National Office Management Assn. (Willow Grove, Pa.). The survey shows that only about one-third of the firms will have parties on company property, that the majority will go to restaurants, hotels or clubs. And coupled with the trend toward more office Christmas parties is this: once a firm gets the habit, chances are that company-sponsored parties will become an annual event.

Fingerprinting Readers: Management men seeking to measure readership of company publications should consider the solution adopted by *American Druggist* magazine, which hired a detective agency to check prints on 1,790 pages of copies that had been in circulation, found 3.3 different prints per page, considered it high readership.



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ADMINISTRATION

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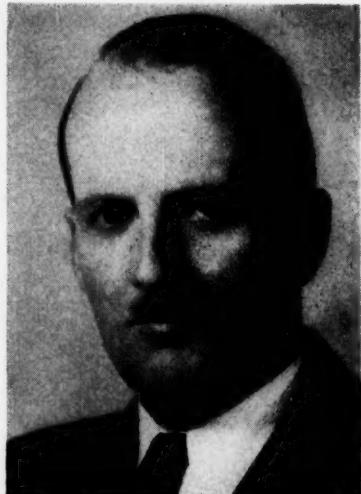
TETRASODIUM PYROPHOSPHATE • MONOSODIUM PHOSPHATE

SODIUM ACID PYROPHOSPHATE

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Write for descriptive folder.*

A. R. MAAS CHEMICAL CO.
Division of Victor Chemical Works
4570 Ardine Street • South Gate, Calif.



Director McLaughlin: Local government will deal with atomic safety.

Atomic Safety Steps

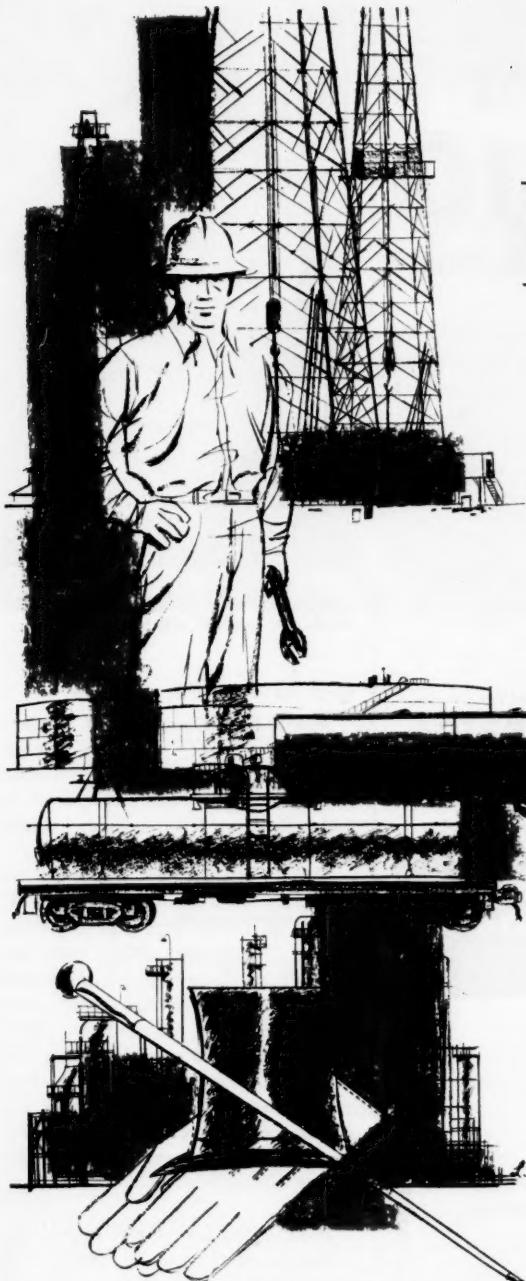
Shutdown measures being taken this week at a Mt. Kisco, N.Y., plant that salvages radioactive materials are focusing attention on the relationship of local government to the matter of radiation and atomic hazards. The salvage company, Canadian Radium and Uranium Corp., has been charged by the New York State Labor Dept. with alleged violations of state safety standards. Company management reports the plant is being shut down for economic reasons.

County Program: The case has been a prime factor in the move by Westchester County's health department (Mt. Kisco is in that county) to set up a program to supervise radiation safety measures at companies with operations in the county. This includes Consolidated Edison Co., a utility company, which is building an atomic-electric plant in the area.

Under the direction of county sanitation director Richard McLaughlin, the program will bring under study all large and small users of radioactive material in the county.

For process management, the Westchester program points up the expectation that, as utilization of atomic materials grows, local governments will be seeking a stronger hand in the direction of its development.

And management, with the prodding of unions, will devote more and more time to dealing on local levels.



ACETONE

Oronite Acetone is co-produced with Phenol in the world's most modern plant, employing the newest manufacturing process and equipment. Unsurpassed in quality, Oronite Acetone is available nationwide in tank cars, tank trucks and drums.



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If your process requires a highly pure product, here again Oronite's advanced manufacturing process permits consistent high quality Phenol to meet your requirements.



plasticizer DIDP-10

for wire coating applications!

TYPICAL ELECTRICAL CHARACTERISTICS

Dielectric constant	@ 60 cycles	4.34
(ASTM D 150-47T)	@ 1000 cycles	4.33

Power factor	@ 60 cycles	0.65%
(ASTM D 150-47T)	@ 1000 cycles	0.05%

Volume resistivity,	OHMS-CM	2.4×10^{13}
(ASTM D 257-52T)		

A modified di-iso-decyl phthalate with superior electrical properties plus low temperature flex in polyvinyl chloride compounds.

RC PLASTICIZER DIDP-10 economically imparts low volatility, low specific gravity and high resistance to water extraction in vinyl insulation compounds.

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ADMINISTRATION



UNITED PRESS PHOTO

Judge Ryan: Dismisses a suit against ADM as 'wholly without merit.'

LEGAL

ADM Suit Dismissed: A breach-of-contract suit against Archer Daniels-Midland in U.S. district court (New York) has been dismissed by Judge Sylvester Ryan as being "wholly without merit."

The suit—asking judgment of \$171,600—was brought this fall (CW, Sept. 7, p. 57) by Eugene Hirsch (New York). He charged ADM used certain process formulas and know-how in violation of their agreements, thus "cheating and defrauding" him. Hirsch claimed to have discovered and developed a caulking composition used in making emulsion vehicles and paints, and to have delivered information on the development to ADM's agents.

Prescription Law Case: In the first sentences meted out in New York City under a prescription law that went into effect six years ago, two pharmacists have received jail terms for over-the-counter sales of prescription drugs. The defendants—Jacob Bosser and Sheppard Greenberg—were sentenced in U.S. district court (New York).

Bosser—owner of Bosser Pharmacy (Bronx, New York City)—was sentenced to one year in jail and fined \$3,000. Greenberg, his partner, was given six months in jail and fined \$1,000. The men were selling Benzedrine, Seconal, Dexedrine and Gantrisin without prescription.

The Bio-Chemical Department

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A high-flash, slow drying solvent with a very mild odor.

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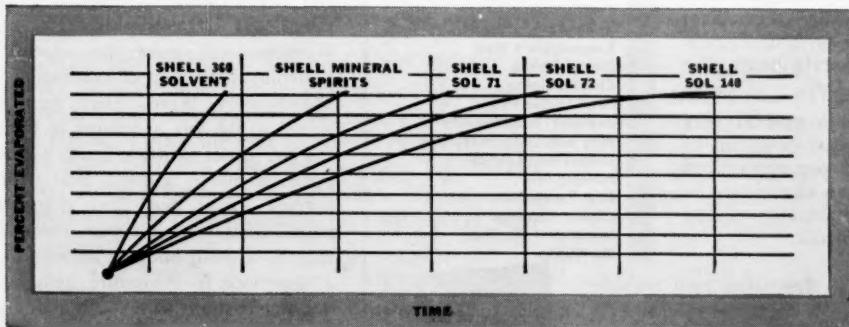


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WIDE WORLD
Negotiator Carey: Doubling the pressure for quick settlement.

AFL-CIO's New Tactic

A new guide to policy in AFL-CIO support of its member unions seems apparent in the merged organization's recent step toward taking a direct part in wage negotiations.

Last week, for the first time, the combined American Federation of Labor and Congress of Industrial Organizations brought the negotiating weight and experience of two vice-presidents of the federation to bear upon current contract talks between Retail Clerks International Assn. and Montgomery Ward & Co.

The vice-presidents — Joseph Keenan, secretary of the International Brotherhood of Electrical Workers, and James Carey, president of the International Union of Electrical Workers — will assist the clerks in hastening settlement of contracts with Montgomery Ward. They were assigned to the job, according to Carey, "to see justice done. When a big corporation makes a quick deal with a corrupt union and then drags out negotiations with a decent union for months without budging an inch, it is a disservice to the entire nation."

Long History: Carey apparently referred to the company's quick settlements with the powerful Teamsters Union, headed by embattled Jimmy Hoffa, although it has failed to settle with the clerks since talks started last July.

The new tack by the AFL-CIO indicates to many observers a new feel-

WAS



IS



NEW LOW PRICE OF 16¢ MAKES 2-NITROPROPANE YOUR #1 SOLVENT BUY!

Price cut 24%! This reduction makes 2-Nitropropane the #1 solvent buy for more and more applications. Such as? Acrylic resin finishes, cellulose acetate butyrate, nitrocellulose, polystyrene, epoxy resins, vinyl spray formulations and paint and varnish removers.

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drying characteristics . . . and more economy per pound of film laid down!

Part and parcel of this substantial price cut is the big increase in production. This new schedule serves to emphasize the long-term future of versatile 2-NP in the protective coatings field. 16¢ per pound, tank car, F.O.B. plant, freight paid to destination. Make it your #1 solvent buy. Write for information on specific applications, and for detailed technical data sheets and a sample. Trained technical representatives can be reached through any CSC sales office. Let them prove how you can save with 2-Nitropropane.

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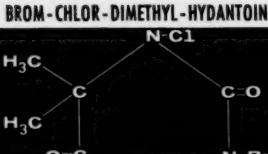
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NOTE—1. DIHALO is unique among halogen carriers as it adds predominantly to the double bond in olefinic compounds to produce halogenated adducts. 2. The introduction of the hydantoin radical as well as chlorine and bromine imparts to unsaturated compounds, increased polarity, adhesive properties and modes of polymerization.

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ADMINISTRATION

ing in its top leadership: firms whose employees are represented in a single location by two or more unions—as is the case with many process companies—may find federation "trouble shooters" on the spot if one union seems to be receiving treatment strikingly dissimilar to treatment given another.

LABOR

Union Rejection: Employees of Shell Chemical's synthetic rubber plant at Torrance, Calif., rejected overtures of two unions for bargaining rights. They voted 475 for no union, 213 for OCAW, and 12 for International Union of Operating Engineers. The engineers had sought to represent boiler and powerhouse employees. OCAW intervened to try for a plant-wide local, and when the engineers failed to get a majority, their votes were carried over to those for OCAW.

Cement Settlement: Arizona Portland Cement Co. has agreed to a 6% wage increase for 170 employees at its Rillite, Ariz., plant. The agreement capped four days of negotiations with United Cement, Lime and Gypsum Workers local. The contract also calls for higher differential pay for workers on night and "graveyard" shifts and extra pay for Sunday work.

Rubber Package: United Rubber Workers Local 553 (AFL-CIO) and the U. S. Rubber Co.'s Naugatuck chemical-resin plant at Painesville, O., have signed an agreement calling for a 15¢/hour raise package, union shop, seven paid holidays, a vacation plan, paid funeral leave time, makeup pay for jury duty and two weeks of annual armed forces training time. Wage increases are retroactive to Sept. 28.

Sickness Insurance: The New Jersey advisory council on disability benefits has recommended to Governor Meyer an increase from \$35 to \$50 a week in maximum benefits under the state's disability benefit law. It also proposed that the taxable wage base for disability insurance purposes be raised from \$3,000 to \$4,200/year. At the present rate, employees making \$3,000 pay \$15. The new base (\$4,200) would raise the contribution to \$21.



THE JUMP FROM FRYING PAN TO ATOMIC FIRE

Exceptionally high purity of new G-E Fused Magnesium Oxide makes it ideal for use in special atomic energy applications. This new refractory material is also being used to give longer life to heating elements in electric frying pans and other appliances.

Another example of



CHEMICAL
PROGRESS

In an atomic laboratory, a crucible containing fission materials is raised to white heat. To meet the special requirements of this work and other high-temperature refractory uses, G.E. is now offering a new, extremely

high purity grade of fused magnesium oxide.

General Electric has conducted chemical research on fused magnesium oxide for many years. G-E Calrod® heating elements were the first to employ the material as a safe, efficient insulation for high temperature units.

An extensive development and testing program has yielded a new grade of fused magnesium oxide that is able to increase greatly the service life of heating ele-

ments in electric frying pans, ranges and other appliances. Today atomic applications can also benefit from this continuing research by General Electric.

Your own investigation of G.E.'s new grade of fused magnesium oxide may bear profitable fruit in still other ceramic, electrical or electronic applications.

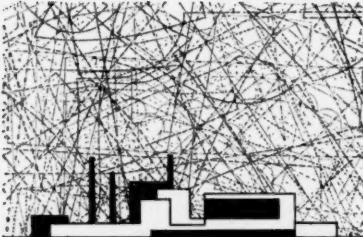
For information on G.E.'s fused magnesium oxide products, write Dept. CMD, CHEMICAL AND METALLURGICAL DIVISION, General Electric Company, Pittsfield, Mass.

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ADMINISTRATION

KEY CHANGES

Huskel Ekaireb, Leo Fernandez and Alfred D. Freund, to vice-presidents, Merck Sharp & Dohme International, Merck & Co. (Rahway, N.J.).

John R. Brown, Jr., to director and vice-president in charge of research and development, Colgate-Palmolive Co. (New York).

George E. Carlson, to board chairman; and Robert W. Carlson, to president; Minnesota Rubber and Gasket Co. (Minneapolis).

Gerald L. Moran, to general manager, Chemical and Metallurgical Division, Sylvania Electric Products (New York).

Ernst T. Theimer, to director of research, van Ameringen-Haebler (New York).

K. H. Rowland, to vice-president—production, Union Carbide Chemicals Co.; and H. D. Kinsey, to president; R. N. Graham and W. F. Reich, Jr., to executive vice-presidents; N. C. Babcock, L. J. Bowditch, G. T. Felbeck and E. P. Shetter, to vice-presidents; Union Carbide Olefins Co.; both divisions of Union Carbide Corp. (New York).

J. G. Affleck, to manager, Rubber Chemicals Dept., Organic Chemicals Division, American Cyanamid Co. (New York).

H. G. Reid, to president and director, Imperial Chemical Industries (New York) Ltd.

William H. Davis, to chemical sales manager, Petro-Tex Chemical Corp. (Houston, Tex.).

Patrick J. Keating, Jr., to director of research; and John K. McKinley, to assistant director of research; Texaco Research Center (Beacon, N.Y.).

KUDOS

To William J. Kroll, consulting electrochemist-metallurgist (Corvallis, Ore.), the 1958 Perkin Medal of the American Section of the Society of Chemical Industry.

DIED

John J. Dowdle, III, 39, vice-president, Great Lakes Carbon Corp. (New York), at Greenwich, Conn.

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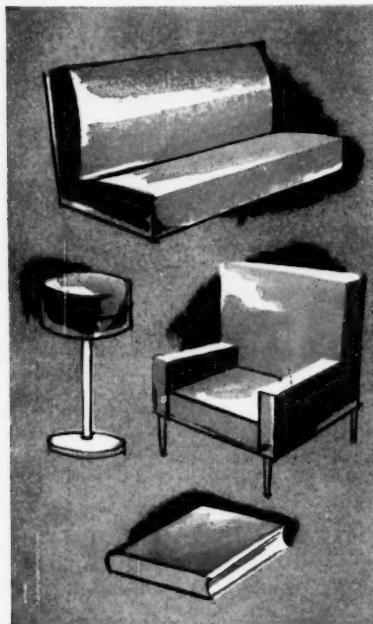
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PRODUCT NEWSLETTER

featuring **THF** tetrahydrofuran

Pastel-colored vinyl upholstery retains its new appearance longer with top coatings made with THF.

PHYSICAL PROPERTIES of THF

Appearance.....	Colorless, mobile liquid
Odor.....	Etherlike
Molecular weight.....	72.10
Freezing point.....	-108.52°C.
Boiling range.....	65°-67°C.
Flash point.....	6°F. (Tag closed cup)
Vapor pressure, mm Hg. at:	
25°C.....	176
45°C.....	385
66°C.....	760
Solubility.....	miscible with water, soluble in most organic solvents.

OTHER USES for THF

Versatile THF is also used as solvent in PVC adhesive formulations, in casting of PVC film, and in applying coatings of PVC and "Saran" resins to films and fabrics. It is finding increased use as a reaction solvent. For specific information on any of these uses write to the address on the right.

THF-applied top coatings give pastel-colored upholstery rich luster and high soil resistance

Today's color revolution is producing smartly turned-out auto interiors and home furnishings in decorator pastel colors. As a result, specifications for soil and stain resistance in the supported fabrics and vinyl sheeting used in these applications are being given even greater emphasis.

Modern tastes also dictate that these materials must have the luster of leather . . . plus high resistance to tearing, abrasion, flexing, moisture, chemical and sunlight attack.

Manufacturers of automobile and upholstery fabrics have found that top coatings made from high molecular weight polyvinyl chloride resins fill all these requirements. That's where the powerful solvent action of Du Pont tetrahydrofuran comes in. At room temperatures this colorless liquid dissolves these resins, which are practically insoluble in other low-boiling solvents. Tetrahydrofuran's high solvent power and rapid solvent action assure good adherence of top coats and permit operation at increased machine speeds.

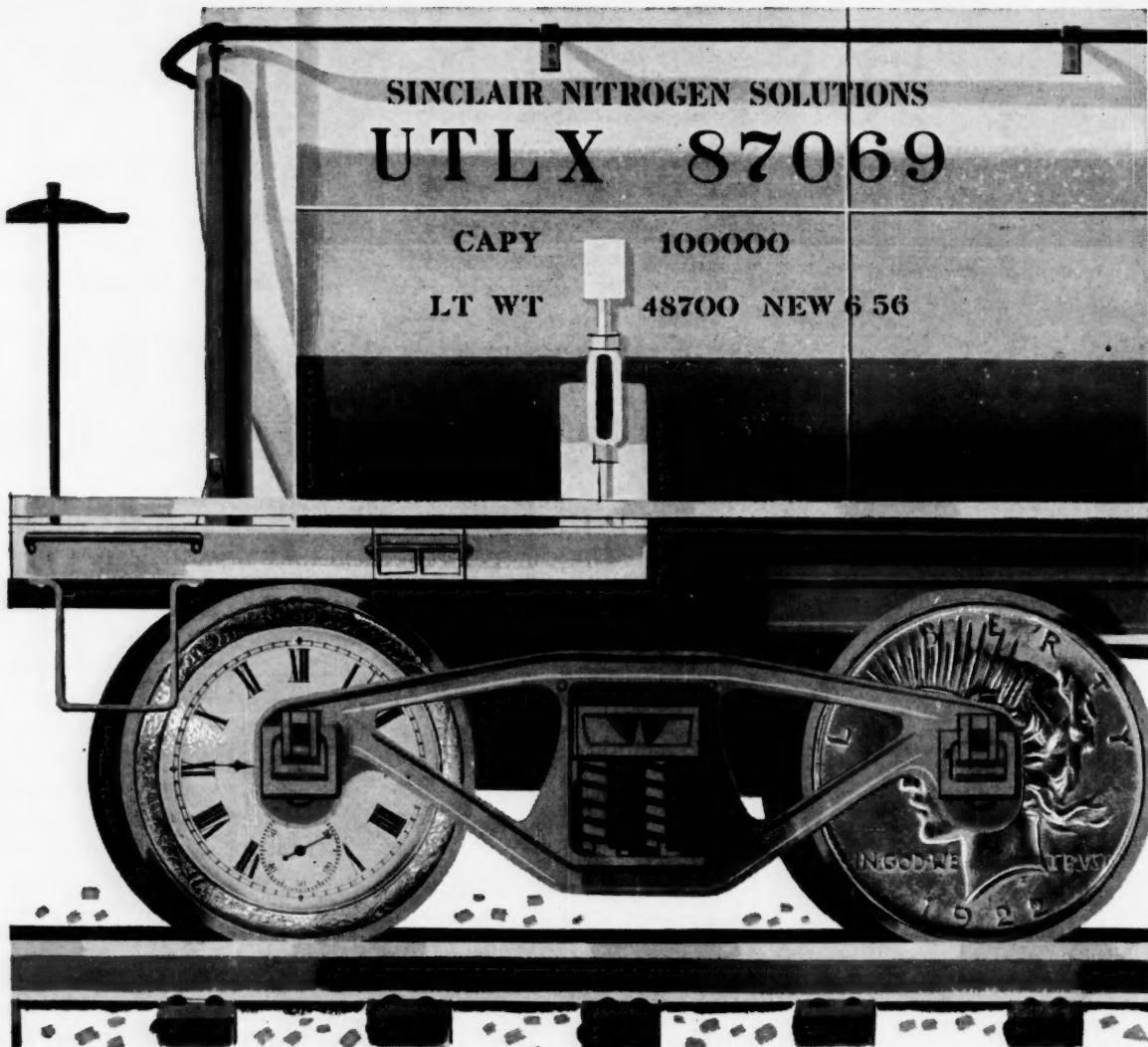
3-way protection against soiling. THF-applied top coatings of high molecular weight PVC resins resist soiling three important ways:

They provide a tough film, resistant to abrasion and scratches, thus minimizing the tendency of the surface to retain dirt and stains. They provide a "barrier effect" to plasticizer migration, which otherwise can impart a tacky feel to the plastic and increase soil susceptibility. They can incorporate a wide range of dulling agents and resins to modify hand and luster with minimum loss of soil-resistant properties.

Efficient recovery methods cut costs. Efficient recovery of THF from solvent applications greatly reduces the cost of this superior solvent. To help you, Du Pont is prepared to assist in the design of both carbon adsorption and water-scrubbing recovery systems.

Availability. Tetrahydrofuran is available in drum, carload-drum, and tank-car quantities. Working samples also are available to manufacturers interested in investigating THF-applied top coatings. Du Pont's technical force will be glad to work with you in developing your particular application of THF. For the complete THF story, write to:

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SPECIALTIES

Checklist on Bactericidal Additives for Textiles

Manufacturer	Tradename	Some Users	Estimated Cost of Chemical
American Cyanamid	Cyana	Two textile mills testing	—
Bex Industries, Inc.	Corobex 50	S. and R. Infants Wear Co. Inc. M. J. Fassler and Co. Inc. (hospital sheeting) Dualoy Inc. American Hospital Supply Corp. Al-Lon Mfg. Co. Inc. Ross and Roberts Inc. Over 100 companies testing	3/4¢/lb. of treated fabric
Carolina Aniline and Extract Co.	Anti-Pers Al 1	20-25 companies testing	2¢/lb. of treated fabric
Permachem Corp.	Permachem	Harte and Co. Inc. (vinyl films) Ohio Falls Inc. (canvas, awnings, etc.) Rudin and Roth (hosiery)	1-1½¢/lb. of treated fabric
Scientific Oil Compounding Co., Inc.	SOCCI 6618	Sears, Roebuck	2¢/lb. of treated fabric
U. S. Process Corp.	Sanitized	J. C. Penny Spring Mills Canadian Celanese Ltd. J. P. Stevens & Co., Inc.	2¢/lb. of treated fabric

Big Future for Textile Germ-Killers?

The spring catalog of Sears, Roebuck and Co., now on the printing presses, should be particularly interesting to chemical specialties makers. Reason: the catalog features a variety of textile products incorporating built-in purifiers, i.e., chemical additives that keep various textile products germ-free for protracted periods. There's been some semisuccessful promotion of these residual bactericidal finishes in the past, but Sears' promotion may signal big-volume usage for them.

The Sears spring catalog will feature, among other items, Kenisan (Sears' trademark) arch supports, vinyl and acetate shower curtains and an aerosol* for do-it-yourself shoe-treating.

Not featured in the spring catalog but planned for the spring retail trade

are Kenisan-treated yardgoods (cotton, acetate, wool felt) and mattresses.

Also for '58, Sears will probably have available under-rug cushioning incorporating an antimetabolite—a substance that retards or prevents the growth of organisms. And for future marketing is Kenisan-treated pillow ticking (now being test-marketed in the Southwest and Southeast), and possibly a line of men's socks, pillow cases, coat linings, sheets, heating pads, underwear, canvas awnings and bath sets.

Kenisan is a generic name, not a specific chemical formula, a Sears representative told *CW*. It's a family of treatments based on SOCCI 6618, a product supplied by Scientific Oil Compounding Co. (Chicago). SOCCI 6618 is a concentrated white liquid made of two familiar biocides—hexachlorophene and *o*-phenylphenol. Hexachlorophene is effective against a large group of bacteria, but not against Gram-negative types, while *o*-phenyl-

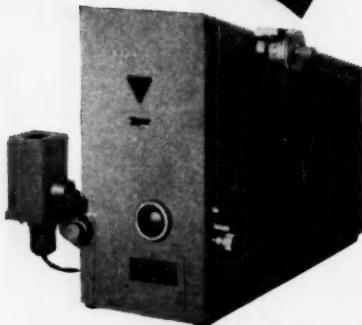
phenol is effective against the Gram-negative bacteria and fungi.

Twenty Years on the Way: Scientific Oil is far from being the first with a combination bactericide-fungicide for fabrics (*CW*, March 23, p. 44). U.S. Process (New York) claims it was on the market over 20 years ago with such a process, trademarked Sanitized. Permachem Corp. (West Palm Beach, Fla.) and Bex Industries (New York) have been selling fabric finishes to textile mills for the past year. American Cyanamid came up with Cyana (nonfungal) a year ago. A more recent entry is Carolina Aniline and Extract Co. (Charlotte, N. C.).

All the companies use about the same sales pitch: the chemical has no effect on the textile hand, it's applied in regular finishing operations without special equipment, it has no undesirable odors, is nontoxic, has no effect on the dye, is effective against both Gram-negative and Gram-posi-

*Sears' aerosol was available in the firm's fall and winter '57 catalog under the name Kenisan. This do-it-yourself treatment isn't permanent—lasts six weeks to six months. Cost: \$1.37 for a 12-oz. can.

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at the turn of a
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Grating Monochromators
with
CERTIFIED-PRECISION
GRATINGS**

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- Physical chemistry
- Spectro-photometry

Pure, intense light . . . ultra-violet, visible, or infra-red—just turn the micrometer drum to set the grating to the desired wavelength. Wide choice of gratings for full range coverage (2000A-14,000A), or for more intensive U-V or infra-red study. Nine monochromator models, with linear dispersion from 66A/mm to 16.5A/mm, first order.



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SPECIALTIES

tive bacteria, is mould- and mildew-proof.

Carolina Aniline makes this reservation about its product: Anti-Pers Al 1 is effective only in the presence of moisture, due to its electrobiological properties (water acts as the electrolyte). Silicone compounds, it says, also impair the efficiency of its product.

Staying Power: Durability claims differ substantially. Sears claims a minimum durability of 20 washings at a temperature of 140 F, under normal washing machine agitation. Bex says that its Corobex 50 will stand up under 50 washings. Cyanamid claims 25 washings for cotton, 10-25 for a cotton-Dacron blend, somewhat fewer for wool and most synthetics. Carolina Aniline says it's still testing washability but that most fabrics stand up under 20-25 washings. Permachem treatments are claimed to withstand 15-20 washings, U. S. Process, five. Makers agree that most treatments are more resistant to dry cleaning than to washing.

Composition Mystery: Manufacturers of the textile treatments vary widely in their eagerness to describe the chemical composition of their products. Scientific Oil, for example, explains that the chief components of its SOCCI 6618 are hexachlorophene and *o*-phenylphenol, and says its formulation must vary with the application: e.g., mattress padding is treated with plain 6618, but outside ticking, which must be stable in ultraviolet light, requires a special formulation of benzoic acid. Carolina Aniline also uses hexachlorophene, but its formula employs acrylic polymers as binders.

Bex tells *CW* that it uses quaternary ammonium salts in its Corobex BI (for nonwashable items) and mercurial compounds in its Corobex 50 (for washable items). Sanitized treatments, trade sources say, also make use of the quats. There's one difficulty in application of the quats to laundered textiles: because they are cationic, while over 70% of commonly used syndets are anionic, "a neutralization reaction occurs, which destroys the effectiveness of the bacteriostat."

Other companies won't say what is in their products, but emphasize what they do not contain. American Cyanamid says no mercurial compounds are used in its Cyana; U. S. Process stresses that no metallic compounds go into Sanitized products; Permachem

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KAY-FRIES

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ESTERS: $\text{CH}_2(\text{COOR})_2$

NITRILE: $\text{CH}_2(\text{CN})_2$

ALDEHYDE: $\text{CH}_2(\text{CH}(\text{OR})_2)_2$

CYANOACETIC

ACID: $\text{CNC}\text{H}_2\text{COOH}$

AMIDE: $\text{CNC}\text{H}_2\text{CONH}_2$

ESTERS: $\text{CNC}\text{H}_2\text{COOR}$

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*Development Status

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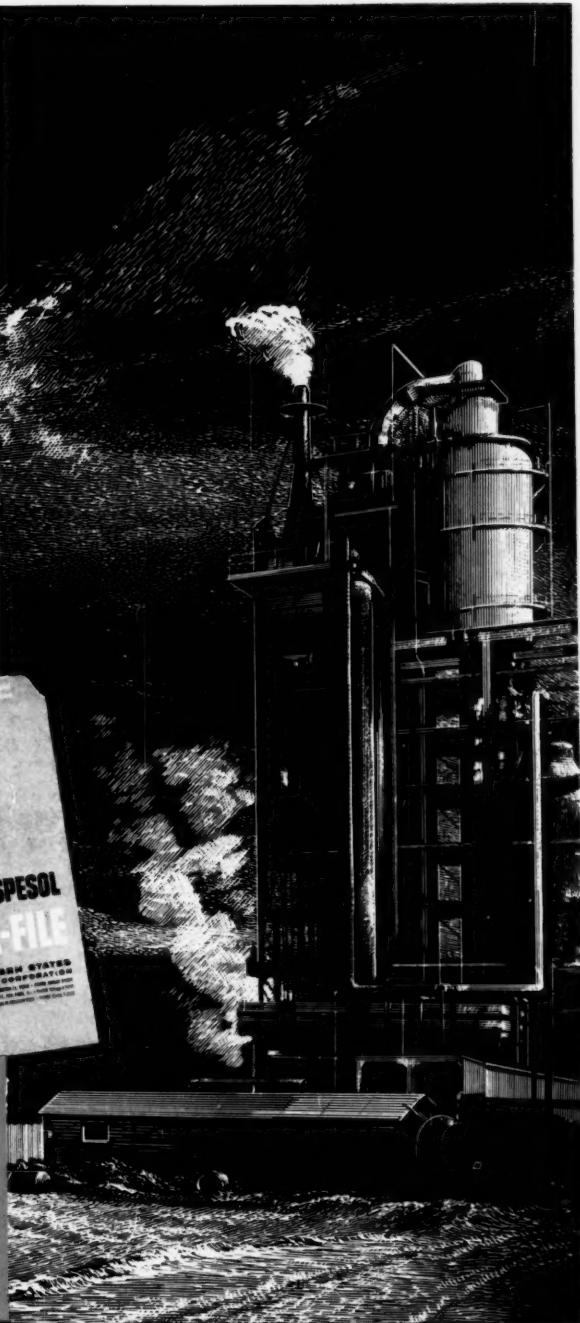
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SPECIALTIES

says its textile treatment does not use colloidal silver or quaternary ammonium salts.

Costs and Quantities: Cost of using the materials varies, obviously, with each specific product, but most makers have computed an average (*see table, p. 97*). Specifically, Sears says that for the chemicals alone used for under-rug cushioning it must pay some 0.3¢ for each pound of fabric treated. Pillow case treatment costs more: 5-6¢ for each pound of fabric. Carolina says the addition of its material will cost a user about 2¢/lb. of fabric treated; it gives a figure of 7-10¢ as the cost of treating a dozen pairs of hosiery.

Quantities used also vary for each product. Scientific Oil gives this as a typical formula for handling 200 lbs. of fabrics: 5 lbs. of SOCCI 6618, 5 lbs. of resin emulsion (or other binder) and 90 lbs. of water. Bex recommends 1 gal. of its Corobex 50 for 800 lbs. of material.

Weakening Resistance: A few makers of bacteriostatics feel that they have an uphill fight ahead of them trying to convince the textile people that their products are more thanales gimmicks. Others are more optimistic, feel that the increasing use of treated fabrics by hospitals will simplify the job of selling.

One sign of a healthy future for bactericides is the possible entry into the field by large firms such as Upjohn and Pfizer. Pfizer tells *CW* that it is conducting a series of preliminary tests to see what effects its antibiotics may have on textiles, and Upjohn is experimenting with two potent antibiotics.

Although Parke, Davis says it's not yet in the field, it was recently visited by Du Pont representatives looking for a chemical that would have an antibacterial effect on nylon. Monsanto tells *CW* that reports that it is working on these agents for textiles are "inaccurate."

At this stage, the whole idea of purifying finishes, while not exactly new, is still a novelty to the U.S. consumer. It's still in the "a little something extra" stage, which helps sales. But if the idea of having germ-free clothes and personal items catches on, the American people, with their penchant for turning luxuries into necessities, might make this item a profitable, high-volume textile specialty within the next five years.

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Research —
Catalyst for Industry

SPECIALTIES

A Turn to Polishes

The trend away from using wax in floor polishes, replacing it with synthetic resins, will undoubtedly be accelerated by development of two new products by Reichhold Chemicals. This week, the firm (see p. 75) showed a pair of new synthetic resins, says they make possible for the first time manufacture of nonwax self-polishing floor finishes that do not water-spot, yet are easily removed when necessary.

Designed to replace shellac in polishes, the new resins could have a terrific sales volume if they're fully accepted. An estimated 30 million lbs. of shellac are used annually by the \$76.4-million self-polishing floor wax industry.

The Reichhold resins, Waterez 1550 and 1551, are alkali-dispersible, modified alkyds, made by esterifying phthalic anhydride with polyols. They are hard, friable materials, similar to dry shellac in appearance, but are lighter. Reichhold proposes to sell the resins for 50¢/lb., about 8¢/lb. cheaper than the grade of shellac they are designed to replace.

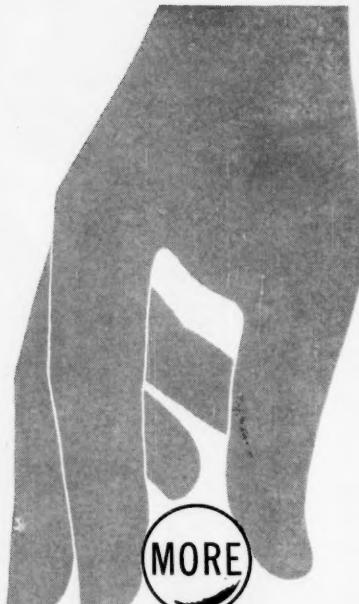
Besides use in floor polishes, the resins are also suggested for formulations of spray shoe dressings, printing inks and textile sizes, as a replacement for aqueous amine-shellac cuts in playing card coatings, and as compounds for felting hats.

The resins are compatible with polymer latexes and other resin dispersions used in the newer "waxless" polishes, are also compatible with natural and synthetic waxes used in conventional floor polishes.

Rockets to Specialties

Currently countering the trend of companies seeking to get into the missile and rocket field is Aerojet-General Corp. (Azusa, Calif.). Aerojet, whose chemical division has heretofore been involved solely with research and development of advanced fuels for rockets and other highly classified research and development for the military, is now taking its first cautious steps into the commercial field, is putting two chemical specialty items into small-scale production.

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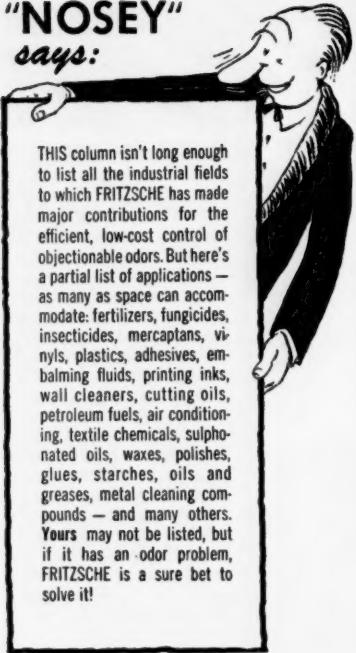
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SPECIALTIES

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The other upcoming item is a catalyst for polyurethane foam. It was developed to increase rate of cure, to provide fewer odor problems with foam and to be free of the disadvantages that impart instability toward hydrolysis. One obvious possibility as a customer: Aerojet's parent firm, General Tire & Rubber Co.

Choice of the items for kicking off its entry into the commercial field stemmed from the consideration that each could be produced on a small scale with existing facilities. But now in design stage is an expansion of facilities that can serve as general-purpose pilot plants for other commercial items.

Production will probably be limited to specialty rather than volume items, to make use of the specialized background of the division's personnel. Many of Aerojet's staff of 140 are trained in such special techniques as the handling of hazardous chemicals, high- and low-temperature chemistry and polymerization.

The company's chemical division was established in '44 as an analytical laboratory to provide quality control, is managed by Don L. Armstrong, who helped pioneer the research of ultraenergy propellants (*CW*, Oct. 12, p. 153).

PRODUCTS

- **Another DET Maker:** Cowles Chemical Co. (Cleveland) is the latest company to be attracted to the repellent field. It's now turning out diethyltoluamide at the company's Skaneateles Falls, N.Y., plant. Its product has a minimum metal isomer content of 95%, is shipped under the tradename Detamide 95.

- **Ultrasonic Detergent:** Acoustica Associates Inc. (Mineola, N.Y.) has developed a water-based detergent suitable for use with all types of ultrasonic cleaning systems. Called Ultrasonic Cleaner 715, the detergent is used in proportions of several ounces per gallon of warm water.

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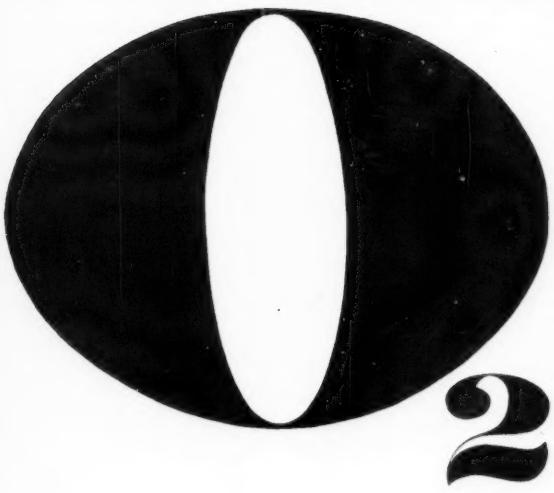
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FLEXOL 380	<10	13	20
Diethyl phthalate	45	60	57
Polymeric A	18	—	—
Polymeric B	17	—	—
Polymeric C	45	—	—

*with a Walker-Steele Swinging Beam Hardness tester

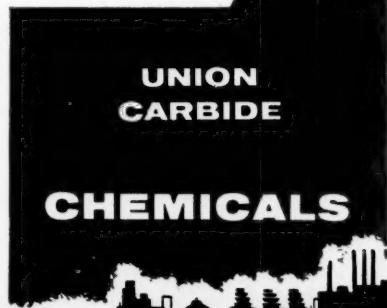
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